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J. Bridgeman's book

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The Whole ART  
OF  
HUSBANDRY;  
Or, The Way of  
*Managing and Improving*  
OF  
LAND.

BEING

A full COLLECTION of what hath been  
Writ, either by ancient or modern Authors: With  
many Additions of new Experiments and Improve-  
ments not treated of by any others.

AS ALSO,

An ACCOUNT of the particular Sorts of  
*Husbandry* used in several Counties; with Proposals  
for its farther Improvement.

To which is added,

The Country-man's Kalendar, what he is to do  
every Month in the Year.

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By J. Mortimer, Esq; F. R. S.

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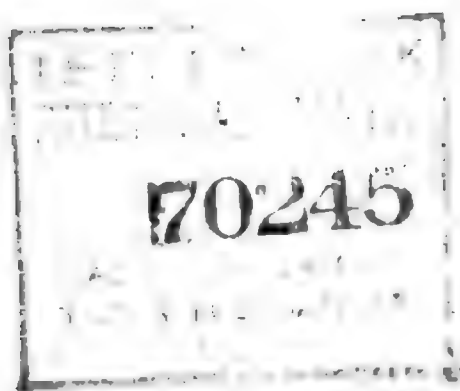
The Second Edition, Corrected.

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L O N D O N,

Printed by J. H. for H. Mortlock at the *Phœnix*, and  
J. Robinson at the *Golden Lion* in St. Paul's Church-  
Yard, M DCC VIII.





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TO THE  
*ROYAL SOCIETY.*

**I** Know not to whom I can more properly address this Treatise than to that SOCIETY, to whose Incouragement, Inquiries, and Directions, it owes its Birth; especially since the Members thereof are the most capable Judges and greatest Incouragers of every thing that may contribute to the Service and general Good of Mankind, and have taken such Pains and Care to trace Nature out in all her Recesses, as to let no useful Part of Knowledge escape their Observation and Consideration: Every one being obliged, in what Part soever of the World they are, to make faithful Records of the Works both of Nature and Art, for the detecting of specious and prevailing Errors, the restoring

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## *To the Royal Society.*

ring Truth to its Lustre, and the improving of it so as to clear the way to what remains undiscovered.

I must here beg Leave to acknowledge my Obligations to the Learned *Dr. Sloan* for his favourable Assistance and Incouragement of this Work; who, agréable to the great Designs of this Honourable Society, has greatly contributed to the Advancement of useful Knowledge.

And tho' *Agriculture* is what some may have a slight Opinion of, yet 'tis one of those Arts, to the Teachers whereof *Dr. Sprat* (now Bishop of *Rochester*) says, the Ancients pay'd the Diviner Sort of Honour. And tho' the Zeal (as he says) by which they expressed their Gratitude to such Benefactors degenerated into Superstition; yet has it taught us, That a higher Degree of Reputation is due to the Discoverers of profitable Arts, than to the Teachers of speculative Doctrines, or to Conquerours themselves. But I need say little  
either

## *To the Royal Society.*

either of the Antiquity or Usefulness of Husbandry, since so many great and learned Men have thought it worth their Study and Commendation, and that the Advantages of it reach all Parts and Persons in the World : So that there can be nothing more universally good, nor consequently better deserve your Honourable Protection.

As to what I here present you with upon this Subject, I shall only say, I have seen and perused the most approved Works both of Ancient and Modern Authors that treat of it, and have Collected what I thought material in them towards the improving of this Vulgar Art. I have also observed the Practice and Experiments of several diligent Husbandmen in most Countries, and have not only improved them, but added many useful Experiments of my own, which, having tried, I can therefore write upon surer Grounds than those, who tho' they have writ more learnedly on the same subject, yet being only con-

## *To the Royal Society.*

templative Men, and having had but little or no Experience of their own, have often erred.

I have endeavoured, throughout the whole Book, to express my self in, as few Words and plain a Stile as I could, for the Benefit of Vulgar Readers, the Culture of Lands being left almost intirely to their Management.

If it should fail of giving general Satisfaction, yet I hope it will at least furnish abler Pens with Materials for a more complete Discourse. However, such as it is, I freely submit it to your Censure and Correction, and do my self the Honour upon this Occasion to declare that I am

Your most humble and

most obedient Servant,

*J. Mortimer,*

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The



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The ART of  
**HUSBANDRY;**  
 Or the Way of Improving of  
**LAND.**

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BOOK I.

Chap. I. *Of Inclosing of Land.*

**T**HE great Improvements that have been made of late in *Husbandry*, and the small Collections that are extant of them, with the difficult Reception that these Improvements meet with, because of the Ignorance of some, and the wedded Opinions of the Generality to the Custom and Practice of their Neighbours, will be a sufficient Justification of this Undertaking: The Design of which is, *First*, To give an Account of the common Way and Method of Managing of Land, and the several ways of Ordering the various sorts of Grains; and *Secondly*, To shew what new Improvements have been made, and what different Methods are used in most Places, and upon what Sort of Land,

B

with



with the Reasons of such Improvements, that so every one may be able to judge of their own Practices ; and to see what Additions are necessary and most reasonable to be made use of for the Improvement of their Interest.

For Labour and Industry being the chief things to make Land valuable, it concerns the judicious Husbandman to consider the Nature of the Land he is to spend his Time, Cost, and Labour upon, and whether it be fit for Meadow, Pasture, Corn, Orchard, or Gardens ; and likewise what Sort of Beasts or other Animals 'tis best to stock it with, and what Sort of Pulse, Trees, Fruits, &c. is best for each particular Soil ; and likewise the particular ways and several Methods used to improve and manage Land to the best Advantage, with the Cost and Produce of it : Concerning all which Particulars, I shall endeavour to give as plain and distinct Directions as I can ; and in order to it begin with the *Inclosing of Land*, as what lays a Foundation for Industry and good Husbandry ; because of the Security it gives a Man in the quiet possessing the Benefit of his Labour and Care. I shall wave the Disputes that have been produced to prove the *Advantages*, or *Disadvantages* of Inclosures and open Fields ; because I think these two things alone sufficient to prove the Advantage of Inclosures, without making use of any other Arguments, *viz.* First, the great Quantities of Ground daily inclosed ; and Secondly, the Increase of Rent that is every where made by those who inclose. And therefore the Method that I shall follow shall rather be to give an Account of the several Sorts of Fences, the Customs and Usages about them, and the Manner and Way of propagating of them, with the Cost and Charges of their making ; than to endeavour the Conviction of those that matter of Fact is not able to make sensible of their own Advantage. For

## *the Way of Improving of Land.*

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For Incloſing of Land the moſt uſual way is with a Ditch and Bank ſet with Quick. In *Marſh-Land*, where is plenty of Water to fill them, they content themſelves with Ditches alone. In *Cornwall* and *Devonſhire*, they make as it were two Walls with flat Stones, laying of them one upon another, firſt two, and then one between, and as it riſes they fill the ſpace with Earth, which binds it together, and ſo they continue the Stone-work, filling of it to what height and breadth they pleaſe, beating of the Stones in flat to the ſides, which makes them lie very firm, and is the beſt Fence of any, where flat Stones are to be had, and what beſt ſecures the Ground and Cattle. Upon theſe Walls they plant Quick and Timber-trees, which thrive exceedingly. In the North-Country, and ſeveral other places where are abundance of flat Stones, they make Fences of them by laying of them one upon another like a Wall, and only lay the Top-ſtones in Clay to keep them together, the Weight of which ſecures the under ones: But as I have no particular Account of theſe Sort of Fences, nor of their Coſt or Duration; ſo I ſhall defer mentioning of them, till I have, and at preſent treat only of the Quick-Fence, and ſome others that I have had experience of.

In *Marſhes* where there are no Hedges they allow the Ditches to be ſix Foot wide, againſt Highways that are broad, and againſt Commons five Foot: But the common Ditches about Incloſures are three Foot wide at the Top, one at the Bottom, and two Foot deep, that ſo each ſide may have a Slope and not be upright, as they make them in many places, which are always waſhing down. Beſides, in a narrow bottom'd Ditch, if Cattle get into it, they cannot ſtand to turn themſelves to crop the Quick; but where the Ditch is four

B 2

Foot

Foot wide, it should be two Foot and a half deep ; and where 'tis five Foot broad, three Foot deep : And so on in proportion.

*White-  
Thorn.*

I shall begin with the *White-Thorn*, as the best Quick to plant, and because 'tis the most common, and esteemed the handsomest and best Fence. It will suit any Soil where a new Ditch and Bank is made, except the dryest Gravel and Sand, and will often grow upon that too, if it prove a wet Year. 'Tis raised of Seed, or Plants ; but Plants are the quickest way, the Seeds lying two Years in the Ground before they spring ; but they grow very fast after two or three Years. Where Sets are scarce, when you fell your Under-woods, or rather the Year before, sow Haws and Sloes in them, and they will furnish you without doing of your Wood any hurt, because you may draw them before they come to be big.

*Black-  
Thorn and  
Crab.*

Next to the *White* is the *Black-Thorn* and the Crab, which make a very good Fence, and is raised as the *White-Thorn* ; only if you sow Apple or Crab-kernels, sow the Punmace with them, they will come up the first Year. *Black-Thorn* is not reckoned so good for Fences as the *White*, because 'tis apt to run more into the Ground, and is not so certain of growing ; but then the Bushes are much the best, and most lasting of any for dead Hedges, or to mend Gaps : Nor are Cattle so apt to crop them as the other. They will grow upon the same sort of Soil with the *White-Thorn* ; but the richer the Mould is, the better they will prosper.

Another good sort of Fence is the *Holly* which were to be preferred before any other, were it not for its slow growth, and the difficulty that there is in getting of it to grow at first : But afterwards it makes amends by its Thickness, Strength and Height. 'Tis raised by Sets or Berries, like *White-Thorn*,



Thorn, and lies the same time in the Ground before it comes up : It will grow upon the dryest Gravel, or amongst Stones or Rocks; and it delights most in light Grounds. If you raise it by Plants, let them be about the Thickness of your Thumb. Plant them in a moist Season in Autumn or in Spring, and take particular care to shade them well with Hawm or Straw, and water them 'till they begin to sprout. If any of them seem to perish, cut them close to the Ground, and they will spring from the Roots. Keep Sheep from them, who are very desirous of cropping of the young Shoots; and dig about their Roots, which will very much help their growth; but by no means lay any Dung near them. The best way of planting of them, is to mix them with the White-Thorn, and to let every fourth or fifth Set be a Holly, by which means, they thrive best, and afford a speedy Fence. As the Holly grows you may pluck up the Quick, and if need be increase the Thickness of the Holly by laying of Layers from it. Some propose to take a well-rooted Set of a Yard long, and strip off the Leaves and Branches, which, covered with a competent depth of Earth, will send forth innumerable Quantities of Suckers, and quickly make a Hedge.

Holly may likewise be raised of the Berries, which as they lie 'till the second Spring before they come up, may be ordered as hereafter is directed for Seeds of that Kind; but as they are a hardy Plant, I think it best to sow them in the place where you design them to grow, only you must mind to keep the place well-weeded before they come up, as well as afterwards. Mr. Evelyns says the Seeds should be picked when they are ready to drop, and that the tenacious glutinous Mucilage that is on the out-sides of them should be rubbed, and washed off, which, he says, is of

great Advantage to cause them to take; and Mr. Cook says, they may be raised by Layers. The Timber bears a great price with the Cabinet-Makers, when large, for inlaying; it being the whitest of all hard Woods.

Where you have any thing of a good Soil, you may take *Elder*-sticks or Truncheons ten or twelve Foot long, and stick in your Bank slope-wise each way, so as to make a Chequer-work; it will make the speediest Fence and the quickest shelter for Gardens of any whatever. 'Tis a Wood very usefull for Turners and Instrument-makers, vying even with the best Box, and for many Uses surpassing of it.

*Alder.* *Alder* makes an extraordinary Fence against Rivers and Streams, and preserves the Banks from being undermined by the Water, because 'tis always sending Suckers from the lowest Roots, which makes it very useful where Streams wear away the Banks, and are widening of their course.

*Furze.* Where there are old dry Banks, or such a dry Sand or Gravel that nothing else will grow on't, the *Furze* is an extraordinary Fence. 'Tis raised by Sets or Seeds; but Seeds are the best way of raising of it, especially the *French Furze* which grows to the height of fifteen or sixteen Foot, and is not subject to run into the Ground, or to spread like the common Sort: It will make a Hedge in three Years time if well-weeded, and carefully kept from Cattle, especially Sheep who are great devourers of it, 'till 'tis of some bigness, and then nothing can hurt it. If 'tis clipp'd, it will do very well, and be very thick: But if let grow at large, it will be the better shelter, and yield excellent Fuel: They make very great advantage by sowing of their Land with it in *Devonshire*; but of that more hereafter. In *France* they make

make inclosures with it that they sow ten or twelve Yards thick, which makes a mighty shelter for Game. I am told that Furze (whether *French* or *English*, I cannot say) will grow upon the Sand in Salt-water; if so, it will be a great Advantage to those that have Walls or Banks next the Sea, to preserve them.

In planting of Quick you are to consider the *Planting.* Nature of the several Sorts of Land you design to plant it in, as whether it be Clay, Sand, Gravel, &c. and what sorts of Plants will best agree with each sort of Soil, and likewise the Soil you have your Plants from, and whether they are raised upon worse Land than you design to plant them in, or else it will be more difficult to get them to grow well, and likewise the manner of planting of them: But as the same method is used in planting of one sort of Quick as is with all the rest, (except only in what I have already instanced) so I shall describe only that of the *White-Thorn*, as being the common sort that is most used.

For the Sets let them be about the bigness of your Thumb, and cut within four or five Inches of the Ground; and if you design your Quick only for a Hedge without a Bank or Ditch, let them be set almost perpendicular in two rows, at about twelve Inches distance from each other; but if you make a Ditch and Bank, mark your Ditch out the breadth mentioned before with a Line, and on that side you intend to make your Bank, lay Turf with the Grass-side downward, upon which lay some of your best Mould to bed your Quick in, and lay your Quick upon it, so as the end of it may be inclining upwards, laying them about twelve Inches a-funder; and be careful to procure those that are fresh gathered, streight, smooth, and well-rooted; adding now and then, at equal distances of about thirty Foot, a young Oak, Ash, Elin,



Elm, or Crab, to grow up with the Quick. When the first row of Quick is laid, cover it with more good Mould, and lay a Turf upon it as before, and some Mould upon the Turf, so as that when your Bank is about a Foot higher, you may against the Spaces of the lower Quick lay another row of Sets, which cover as you did the former, and top the Bank with the Bottom of the Ditch, upon which set the dry or dead Hedge to defend and shade the under Plantation. The Stakes are drove into the loose Earth at two Foot and a half distance, so low as to reach the firm Ground. Oak-stakes are reckoned the best, and Black-Thorn and Sallow next; let the small Bushes be laid below, but not too thick, only a little to cover the Quick from the biting of Cattle when it springs, and the long Bushes at the Top to bind the Stakes in with by interweaving of them, and to add a farther strength to the Hedge you may edder it as they call it, which is to bind the Top of the Stakes in with some small long Poles or Sticks on each side; and when the eddering is done, let the Stakes be new drove, because the waving of the Hedge, and the eddering are apt to loosen the Stakes.

Your Quick must be constantly weeded and carefully kept from Cattle, especially Sheep; and if you do not find it shoot well, or that it should happen to be cropped with Cattle, cut it in *February* within an Inch of the Ground: This will cause it to strike fresh Root, and often help it much in its Growth.

*Hedges to  
plash.*

When your Hedges are about eight or nine Years growth, about *October*, or (which is better) in *February*, plash them; but as the plashing of an old Hedge hath some particular things belonging to it that are not in a new, I shall suppose the Hedge to be of twenty or thirty Years growth, and that there are old Stubs in it as well as young Shoots, which old  
Stubs

Stubs must be cut sloping off within two or three Inches of the Ground, and as near as you can the best and the longest of the middle-sized Shoots left to lay down; some of the strongest of which may at five or six Foot distance be left at the height you intend the Hedge instead of Stakes; and where such Stakes are wanting you must supply their room with Stakes of other Wood. When you have thinned your Hedge so as to leave on the Stubs only those Shoots that you design to use, that you have room to put a Spade through them, begin and cleanse your Ditch; keeping each-side sloping as in a new Ditch; and where you find your old Bank hollow, or that the Earth is washed from the Roots of the Quick, face it (as they call it) with so much of the first spit of Earth, that you dig out of the Ditch as you need; the rest, with what you dig out at the second spit, lay upon the Top of the Bank, which you must carefully see that the Work-men do: For it being more Labour, they commonly lay as much as they can upon the side or face of the Bank, the weight of which, when wet comes, commonly makes it slip into the Ditch again, and often brings a great part of the Bank with it; whereas what is laid upon the Top every time heightens the Bank, and makes any indifferent Hedge a strong Fence. In the plashing of your Quick, avoid two extreams, first the laying of it too low and too thick, which makes the Sap run all into the Shoots, and leaves the Plashes without Nourishment, which with the Thickness of the Hedge kills them: Secondly, avoid the laying of them too high, as is commonly used in the *North*, which draws all the Sap into the Plashes, and so makes but small Shoots at the bottom, and by that means makes the Hedge so thin, that it neither preserves it self from the Cattles cropping, nor prevents their going through: For which reason I prefer the middle-



middle-way used in *Hertfordshire*, where are the best Hedges I have seen in *England*. When you have bent your Shoot that you design to plash, give it a small cut with your Bill half way through, something aslope downwards, and then weave it about your Stakes, trimming off the small superfluous Branches on each-side of the Hedge that straggle too far out: And if for the first year or two, you can plow or mow the Field where you make a new Hedge, it will give the better opportunity for the Hedge to grow and thicken; but where the Stubs are very old, 'tis best to cut them quite down, and to secure them with good dead Hedges on both sides 'till the young Shoots get up tall enough to plash, and in the void places plant new Sets.

*Bank-  
Fences.*

But the best Fence, and, I believe, the cheapest, considering the lastingness and goodness of it where flat Stones are not to be had, is in a grassy place to dig some Turf a Spit, or near a Spit deep, the breadth of your Spade, and about four or five Inches thick; lay these Turfs with the Grass outward, even by a Line on one side, and on the back-side of these lay another Row of Turf, leaving a Foot-space of solid Ground on the out-side to prevent the Bank from slipping in, if the Ground should any way be faulty; on the out-side of which you may make a Ditch of what depth or breadth you please, or you may lower the Ground on each-side with a small slope two Foot deep, and then you will have no loss of pasture by the Fence, because it will bear Grass on both sides; and with the Earth that comes out of the Ditches or the sloped places fill the middle of the Bank level with the Turf on each-side, and then lay two more Rows of Turf upon the first, and fill it again as before. This do 'till your Bank be four Foot high, or of what height you please, only your Foundation must be

be something broader, if you make it higher; and you must observe on each-side to give a small slope to the Bank, so as to make the Top about three Foot wide, upon which plant your Quick, making of the Top a little hollow to keep as much of the Rain to the Quick as you can, and plant your Quick about a Foot or more in depth; by this means you will have a Fence six Foot high, besides the Hedge on it, which will (except in a very dry time) be always green on both sides like a green Wall, and make not only a pleasant Fence, but what will keep all Sorts of Cattle within their Bounds, and the Quick that you plant upon it will grow much better, than if planted any other way; and if any die (which it will hardly do) you may renew it when you will, or fill the Spaces by Layers from those that do grow, and the Roots of the Grass will bind the Turf so together, that in one Years time it will intirely become solid, that you cannot see the Joints, nor get one of the Turf out, and it will be much stronger when the Roots of the Quick come to bind it together too; only you must take care that, on or near the Top at the first making of it, on each-side to set a small Hedge of about a Foot high to prevent the Sheep from running up it, and that you do not make it when the Earth is too dry; because if a great deal of wet should suddenly follow, it will cause the Earth to swell too much, and by that means may somewhat indanger the falling of some of the out-side, though I have made a great deal of this Sort of Fencing without having any of it fall: If it should, 'tis easily repaired. This Fence in good digging Ground where Men work for Fourteen-pence a day, may be made and planted with Quick for two shillings a Pole; but if you design it a Fence to keep in Deer, at every eight or ten Foot distance, set a Post with a Mortice in it

it to stand a little sloping over the side of the Bank about two Foot high; and into the Mortices put a Rail, which a Bough of a Tree or any thing will make; and no Deer will go over it, nor can they creep through it, as they do often, when a Pale tumbles down. The Quick on this Bank you may keep clipped, which will make it a fine Fence, and 'tis one of the best Fences to afford shelter for Cattle.

Having shown you how to inclose Land, I shall in the next place consider the several Sorts and Kinds of it, as they may be proper either for *Grazing*, *Corn*, or *Planting*, and begin with Pastures and Meadows.

## Chap. II. *Of Pasture and Meadow-Land.*

Pastures and Meadows are of such advantage to Husbandry, that many prefer them to Corn-lands, because of the small Hazard, Charge and Toil that attends them, and as they lay the Foundation of most of the Profit that can be expected from the Arable, because of the Manure the Cattle afford: And indeed where Dung is not to be bought, or other Manure to be had, there ought to be a Proportion taken care of between the Pasture-lands and the Arable, that so such a quantity of Dung may be raised as may be necessary for the Arable; or else the Arable-land must be proportioned to the quantity of Dung that is raised from the Pasture, because proper Manure is the chief Advantage of Arable-ground.

Now all Feeding or Pasture-lands are of three Sorts; *First*, Up-land, that is such as lies so high as not to be over-flowed with Rivers or Land-floods; *Secondly*, Those Lands that lie near Rivers or Fens: And, *Thirdly*, Those that lie near the Sea.

**First,**



First, *Up-lands*, that lie either upon the Tops or *Up-land* sides of Hills or Rising-grounds, and consist either of Sand, Gravel, Chalk, Rock, or Stone, Hazelly, Loam, Clay, or black Mould, and are best for Grazing, or Corn, according as they lie moist or dry; which depends much upon their Situation and Nature: Those Lands that lie upon the Tops of Hills, and that lie flat, are commonly the dryest; and those upon the sides, the moistest; because of the Moisture that continually is ouzing out of them: And so likewise the Chalkey and Clay-lands are most apt to be moist, especially in Winter; because they retain the Moisture a long time, though they have also the Inconveniencies of the Sand, Gravel, Rocky and Stony-lands, to burn in hot Weather, to chap in Summer, and poach in Winter. The black Mould and some of the hazelly Loams are the best for Grass, and Corn too, especially if the latter is not subject to Worms; because they neither chap, poach, nor burn. Too much or too little Water is almost equally prejudicial to Meadows, but the best Lands for Meadows or Pasture are either low Lands, or hanging Grounds, or any rich Soil that hath a moist Bottom, especially where any thing of a little Brook or some running Spring may be brought over it, and where there is some descent in the Meadow, that the Water may not lodge on it: These Meadows are much better than those by great Rivers, where Crops are often lost. The worst of Up-land Meadows is that they often need mending or feeding, which the other never do; but then the Hay of the former is much finer, than that of the low Lands.

As the Improvement of these Lands is the same with that of the Arable; so I shall defer treating of it 'till I come to treat of the Improvement of Corn-lands: Only you must note, that as the Dung  
that



that is laid on Arable-ground is harrowed in with Harrows; so that Dung that is laid on Pasture should be well harrowed in with a great Bulh, or with a Gate stuck full of Bushes; and that all Dung that is laid on Pasture-land must be done in Winter, that the Rain may wash the Fatness of it into the Roots of the Grass before the Sun dries it away. Many commend something of Mould mixed with Dung to be better than Dung alone, because it washeth better to the Roots of the Grass, and incorporates with the Earth: But the best Manure for Meadows, is the Bottom of Hay-mows and Hay-stacks, because of the Mould 'tis composed of, and the Hay-feed that 'tis mixed with, which will both mend the Land and increase the Grass; for which reason due Care ought to be taken not to mix any Hay-feed with the Dung-hills that you design for Corn-ground, because 'tis apt to breed Grass and Weeds on them.

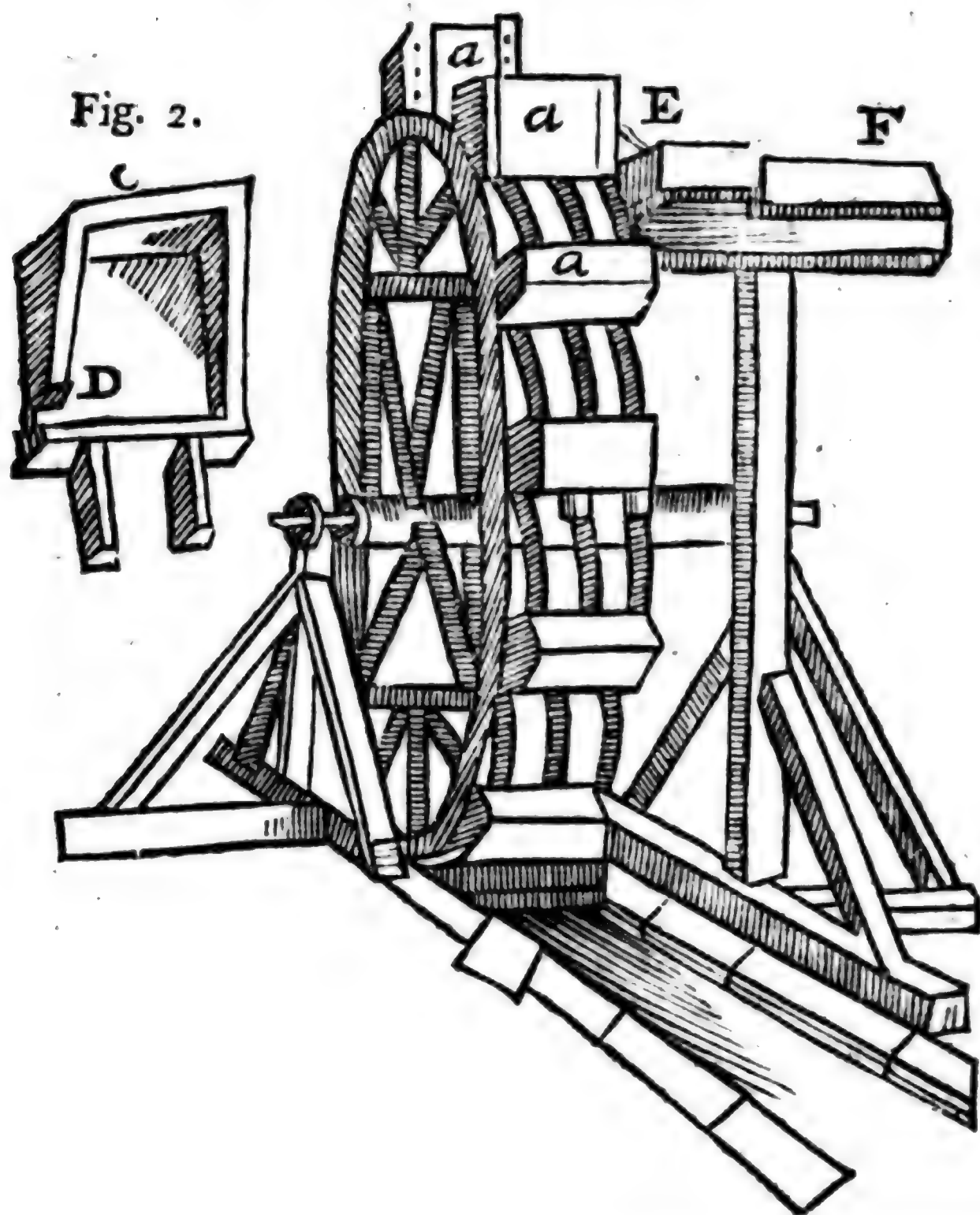
*Marsh-  
Land.*

A second Sort of Grazing-ground is that which lies near *Rivers* or *Fens*: As to Lands lying near Rivers, the great Improvement of them is their over-flowing, which brings the Soil of the Uplands upon them, so as that they need no other mending though constantly mowed. The great Inconveniency of these Lands, is their being subject to Summer-floods; which high Hills near the sides of the Rivers, and the long Course of them bespeaks to be frequent; and though near such Rivers is commonly the richest Land, yet there is the most danger of the Crops being spoiled, especially where they are not inclosed, that they may be fed with Cattle; which I think much the safest way of managing of these uncertain Lands, especially when feeding Cattle bears any thing of a Price: But the most advantageous Sort of these Lands are those that may be over-flowed or laid dry, as you find occasion, that you may improve them

them with the Winter, and keep out the Summer-floods, when the Grass is long: But as only particular Situations will afford these opportunities; so there are but few places will allow of all these Advantages: But as all Sorts of Over-flowings are of great advantage to Land, so I shall endeavour to give a particular Account of the Method of it.

### §. 1. *Of Over-flowing of Land.*

This is commonly effected by diverting the Streams of Rivers, Brooks, Land-floods, or Springs, or some part of them, out of their natural Channel: But where the Streams lie so low as to be incapable of over-flowing the Lands, they are made use of to turn such Engines as may raise a quantity of Water to do it: The best and cheapest Engine for the effecting of which is the *Persian Wheel*, which may be made of what bigness you please, according to what height you would have the Water raised, and the Strength of the Stream that turns it. At *aaa*, &c. are several Boxes set round the Wheel that turns it and raises the Water; at *Fig. 2.* is a particular Description of the Boxes as open, the flat Side of which is turned against the Stream; *C* shews the side that dips the Water; and at *D* is the place where the Water runs out when the Wheel comes to the height of *E*, at which place is a Trough at *F* to carry the Water off; and where Streams are not to be had, the Wind is made use of for the same purposes to work Pumps and other Engines: But as Lands near unto or bordering upon Brooks or small Rivers admit of greater Falls and Descents, than bigger Rivers do, which commonly run more slow and level; so they do often give opportunity for these Improvements, whereas the other doth it very rarely;



rarely; but when it can be effected, large Streams make the richest Lands, because the large Rivers are usually the fruitfulest (as I said before.)

*Trenches  
to carry.*

When you have got your Water up to the highest part of the Land, that you can bring it to, make a small Trench to carry some of the Water in, to give you the level of the Land, keeping of it always as much as you can upon a level, or upon the highest

highest Part of the Land, that so from the upper Part you may be able to water the lower when you will; and by carrying of the Level of this small Trench you will be directed how to cut out your main Trench; which ought to be made big enough to receive the whole Stream that you raise, and to be rather broad than deep. At convenient distances, according unto the bigness of the Stream, and the quantity of the Land you are to water, make several small Trenches, making your main Trench the narrower, proportionable to the number of Drains you lead from it; only you must note that the greatest Advantage of over-flowing is, where you can do it frequently, and draw it off quickly; because where Water stands long on Ground, especially in Winter, 'tis apt to breed Rushes and Weeds; and therefore where any such Inconveniency is, draw it off by small Trenches.

Some graze their Land 'till *Christmas*, and some *Times of* longer; but as soon as 'tis fed bare from *Alballow*, *Over-flowing* tide to Spring, that the Grass is not too high, is the best Time for over-flowing, except it prove a dry Time in *April* or *May*: If it do, it will be of mighty Advantage; for in hot Weather the Grass grows three times as fast if moistned, as at other times. Land-floods are best to over-flow with in Winter, and warm fatning Springs in Summer; only you must observe to let the Water dry in before you water it again, and not to let Cattle poach it; and that you water it at Night so as the Water may be gone before the heat of the day comes, which is apt to occasion the scorching of it, and to rot the Roots of the Grass by lying too long on the Land. The washings of High-ways, of Towns, or Streets, especially of Commons, where Sheep feed, is a very great Improvement of Land or Trees.

C

In



*Barren  
Springs.*

In some places are Springs whose Waters are injurious to Land, as such usually are that flow from Coal-mines, or any sulphureous Mineral, because they are of such a brackish, harsh Quality, that they kill Vegetables, instead of nourishing of them ; as too much Salt, Urine, or Dung will do, if not applied in due Quantity. Yet I cannot but think that even these Waters would make a great Improvement, if sparingly used, and in wet Times, that a great Quantity of other Waters might mix with them. These Waters are commonly of a reddish Colour, and leave a reddish Sediment where they run, and are much better when they have run some distance, than at their first breaking out.

*Some  
Lands not  
improved  
by water-  
ing.*

Also some Sorts of Lands will not be improved by watering, except with Land-floods, and in Summer, when 'tis a very dry Time, as your cold Clay, and strong Lands that lie very flat, partly because of their cold Nature, and partly because of their Flatness, and because Water will not easily penetrate stiff Clay ; and therefore light dry warm Grounds are the most improved by watering ; but as some Lands are improved by over-flowing, so the chief Improvement of others is by draining ; as,

### *§. 2. Boggy Lands, and Lands lying near Fens.*

Boggy Lands are of two Sorts ; *First*, Those that lie between Hills which commonly have descent enough to drain them : *Secondly*, Those which lie in flat Levels and Fens ; but these being part of the Fens, I shall refer the Description of them 'till I come to treat of Fenny Lands. Boggy Lands are fed by Springs pent by a Weight of Earth that dams in the Water, and causes it to spread in the Ground so far as the Earth is soft. Therefore  
you



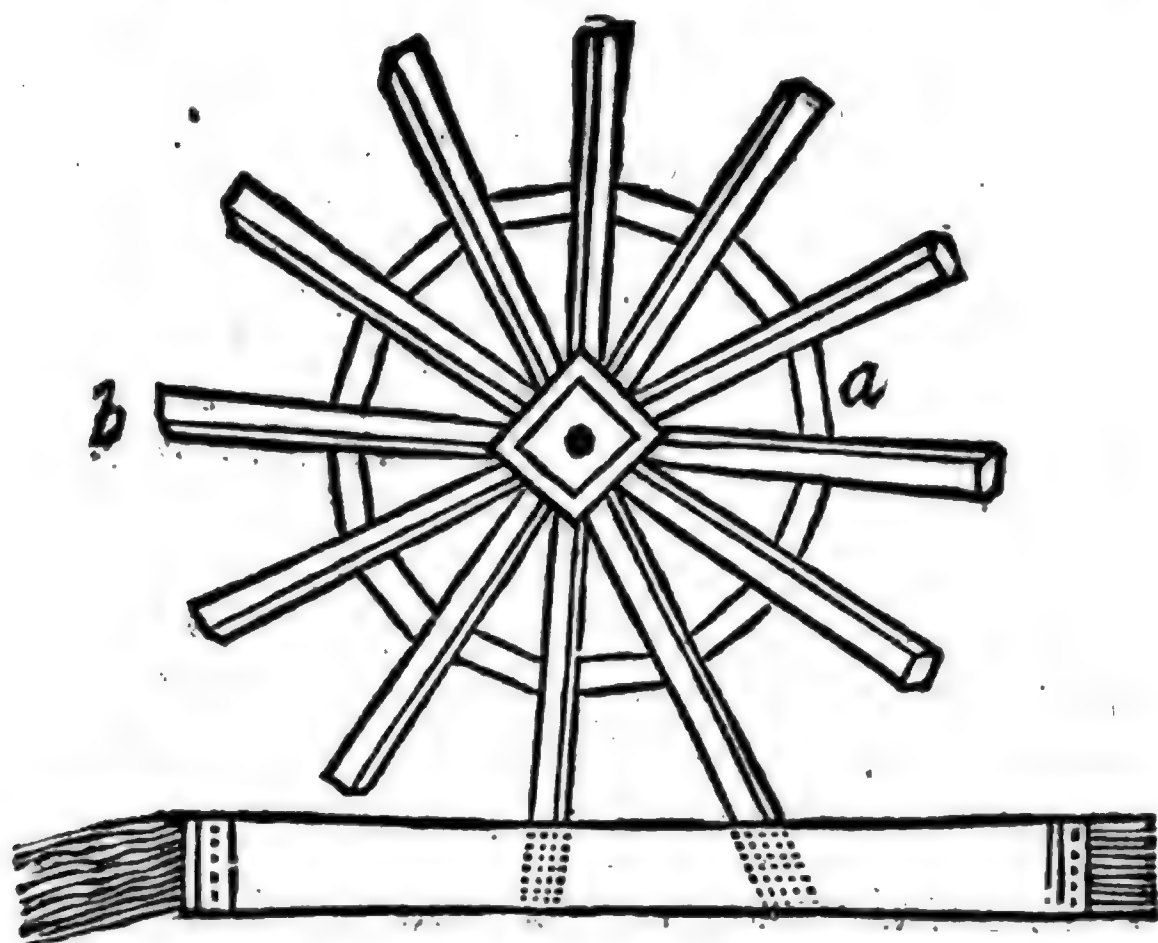
you must observe where your lowest place is, and what descent you have, that so you may cut through the Earth deep enough to take all the Water away from the bottom of the Bogg, a Spit below the Springs, or else your Work will be but of little value. In rushy Grounds the Springs are most commonly found at the first or second Spit, where any thing of small Gravel or Stonyness is to be found, and sometimes lower in a hungry Gravel: But 'tis always lower in boggy Land than rushy, and is deep according to the Weight of Earth that penns it in. The best way is to begin the Drain at the lowest place, and so to carry it into the Bogg towards the Spring-head, where you must make such Trenches either round or cross the Bogg as you shall find necessary to drain it thoroughly. If your Drains be deep, that you fear Cattle falling into them, fling in Stones and Brick-bats, and cover them with Wood, Flags, Turf, &c. laying the Earth upon it again, and the Water will drain between the Stones: But whatsoever Drains or Trenches you make that you leave open, never lay your Earth on heaps by the sides of them as most do; but let the Earth be flung as far from it as you can, or spread in low places that are near, if your Trenches are small: But where large, and the Work is not too great, carry it away in Wheel-barrows or Carts, where the Ground will allow of it.

### §. 3. *Of Fenny Lands.*

Fenny Lands are of two Sorts; *First*, Those that are only drowned by Up-land Floods and great Rains, and are very large, and upon great Levels, that the Water cannot run off from them 'till the dry Weather helps to dry it up: *Secondly*, Those that are constantly wet, only in dry Times

they are shallower than in wet. Now in draining of either of these Sorts of Lands you must consider two things, *First*, The laying of them perfectly dry, which can only be effected by the way before proposed for the draining of boggy Land ; or *Secondly*, Only the taking off from them the Land-floods, Rains, &c. that fall on them : The one makes a perfect Cure, and the other only makes the Land serviceable in dry Times, and leaves the less Water for the Sun to dry up. And therefore you must consider the lowest Part of the Land, and take care to carry off the Land-floods and Streams that way, before you attempt any thing of a through draining, lest your After-cost and Labour prove unsuccessful : Which point if you can gain, make your main Drains wide and deep enough to carry off the Water from the whole Level, and as straight as you can, carrying all your small Drains into the middle Drain, which is the Main of the Work ; always observing to keep your Drains largest at the Mouth, and to narrow it by degrees, as they run more up into the Lands : These Drains should always be kept cleansed in Spring and Autumn from Mud, Weeds, &c. And though the Land-floods are a great Improvement of any Land where a vent can be had for them ; yet where you cannot have it, because of the Waters meeting with a full stop, so that it must be raised with artificial Engines ; the best way is to turn all the Water you can from it, and to meet the Land-floods upon the higher Grounds where they may be taken so as to be carried into Rivers and Channels that lie higher than the Level of the Fens, that so you may have the less Water to raise with Engines ; the best Sort for which purpose that I have yet met with ( this being a particular that I should be glad of having more intelligence about from any that will

will be so kind as to send any such thing to the Publishers ) for the draining of Lands, is the following Wheel, much used in *Lincolnshire* to drain the Fens, which is turned with large Wind-mill sails, and are made proportionable to the strength that is to turn them. 'Tis a vast quantity of Wa-

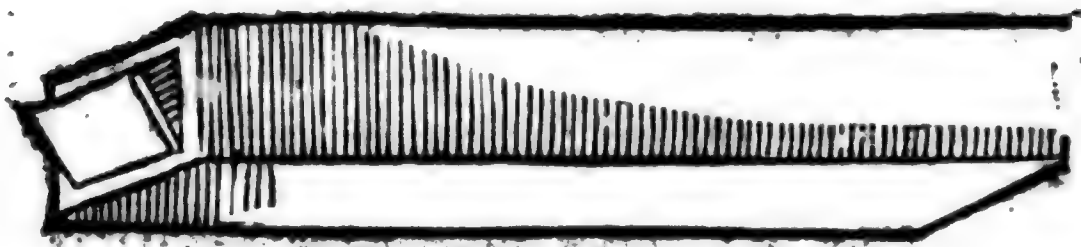


ter that their turning will row along upon a flat, where the Water is not to be raised any height, the Spoaks being made broad, and set a little sloping the better to row the Water, as you may see in the Figure, which Spoaks are exactly fitted to move between two Boards; but when they are to raise the Water any small height above the Level, the Spoaks are made hollow like Scoops, and set so as to deliver the Water at that height; but if the place requires the casting of it over a Bank that is of any great height, the end of the Spoaks are made like Boxes; which as the Wheel rises lets the Water run into the Circle at *a*, which is made hollow to receive it: And a Chanel being made on the Back

of the Spoaks delivers the Water at *b*, as the Wheel descends.

If any Dryness appear on the Surface of the Levels, and that there are Springs left, search for them; and when you have found them, order them after the same manner, as you were to order the boggy Land: But if any small Hollownesses remain that do not dry, you need not trouble your self about them, if there be no Springs in them that may cause their over-flowing in Winter.

They have a very good way in *Essex* of draining of Lands that lie below the High-water, and that are something above the Low-water-mark; that have Land-floods or Fleets running through them, which make a kind of a small Creek. These Lands when they first inclose them from the Sea, they do it with a Bank which they make from one side of the Land they design to take in, to the other, except a Space that they leave, where the Creek or Land-floods run into the Sea: This when they begin to stop, they do at once with a strong firm Head; only according to the Quantity of the Water that they have to vent, they lay in it several square Troughs which are composed of four large Planks of the same length that they design the Thickness of the Head to be, and towards the Sea is fitted a small Door which opens when the fresh Water bears upon it, and shuts when the salt Water rises, as may be seen in the following Figure, that End where the Door is being put next the salt Water. These Marshes are



com-



commonly very good Land, and furnish Cattle with good Water; which is a thing much wanting so near the Sea, where these Marshes commonly lie.

Mills are in many places a very great prejudice to Land near Rivers, by damming up of the Waters, and by keeping of them continually wet. Where you have any such inconveniency, though you cannot draw the Water down because you are not owner of the Mill; yet you may at some distance from the River make drains to carry off the cold Water that prejudices the Roots of the Grass, into some place of the River below the Mill, which will be but a small Charge; and will much help your Land from being chill'd with the continual Coldness of the Water.

#### *§. 4. Of Marshes near the Sea.*

A third Sort of grazing Ground is that near the Sea, which is commonly very rich Land: But as these Lands commonly lie very flat, so 'tis necessary to keep all the Water you can from coming upon them; especially that of the Sea, which is many times done at great Charges, according to the length, breadth, and height of the Walls, which must be proportionable to their being exposed to the Waves of the main Sea, or of a broad or narrow Creek or River, and of the Rise of the Tide. Two main things that are commonly wanting in these Lands, are good Water and good Shelter; which may be helped in many places by making of good Ponds to hold the Rain-water, and by planting of Trees and Hedges, which in most places would be of great Advantage to the Grass to shelter it from the Sea-breezes; which often in these Lands, in the Spring, will cut off the Tops of the Grass, as if mowed, especially in the



Northern-parts. These Lands fat Cattle the soonest of any, and preserve Sheep from the Rot: But they would be much better for all Sorts of Cattle than they are if they were better sheltered; and where they cannot be inclosed round, if in the middle of the Marshes, Banks were cast up in Form of a Cross, or in the Form of two half Circles, that they might be a shelter for Cattle, let the Wind blow which way it will, and planted with Hedges and Trees for Cattle to get behind in stormy Weather, it would be a great Advantage to them.

Upon the Sea-coast are a great many Parcels of Land that would pay well for the taking in, as about *Boston, Spalden*, and other Parts of *Lincolnshire*, where the Sea falls off from the Land; so as that upon the out-side of the Sea-walls on the *Omse* (though every Tide covers it with salt Water) grows a great deal of Grass, and the *Omse* is firm to ride on, even when the Water is upon it. This *Omse* when taken in, hardly sinks any thing at all, and they dig the Earth for the Walls on the out-side of it, which the Sea in a few Tides fills up again; and though the Sea at High-water comes but to the Foot of the Bank, yet once in a Year or two some extraordinary Tides go over the Banks, though they are ten Foot high, fifty Foot broad at the Bottom, and three at the Top; for the making of these Banks they give twenty six Shillings a Pole, the Earth being all carried in Wheel-barrows, and the Face of the Bank next the Sea turfed, on which side is the chief Slope. Whereas in *Essex* about *Malden, &c.* the *Omse* is like Mud, and so soft that you can hardly tread on it, bearing nothing but a few Weeds; and if they dig any thing of a hole in the *Omse* on the out-side of the Bank, if 'tis any thing near, the Sea will enlarge it so as to undermine their Walls: For which reason they take all  
the

the Earth, that they make their Walls with from the In-side; and though the Tide commonly comes up to the Foot of the Bank, yet they keep out the Spring-tides there with a Wall of four Foot high, three Foot broad at the Top, and ten or twelve Foot at the Bottom; which Walls they have made for four Shillings a Pole. This Sort of *Owse* when it comes to be inclosed, sinks three Foot deep. One Acre of these Lands I have observed not to be in proportion to the distance each are from *London*, of above half the Value that those are that are gained from the Sea in *Lincolnshire*.

§. 5. *Of Lands over-flowed by Sea-Breaches.*

Though Salt moderately used is a very great Improvement of fresh Lands, yet too much kills all Sorts of Vegetables. Therefore as soon as your Breaches are stopped, make Trenches, and draw the Salt-water off as soon as you can into some low Place; where by an Engine, or otherways you may cast it over the Bank into the Sea, or into some wast Ground, except 'tis so small a Quantity as the Sun will soon dry up; and lay as much fresh Earth or Mould upon it as you can to abate the Saltness of the Earth, plowing of it three or four Years to let the Rains and Air into the Land to freshen it.

As to what relates farther to the over-flowing of Land, making of Drains, Sea-walls, with an Account of particular Engines for such Works, with the Cost and Charges, and the Nature of the Land taken in, &c. if any that are willing to encourage this Work will communicate them to the Publishers, they shall be added either with mentioning of their Names that send them, or not, as desired; and be inserted as Additions to the Appendix; that so against the publishing of it, I may be

be able to give the fuller Account of these Particulars.

All these Sorts of grazing Grounds are commonly stocked the best with the largest Oxen, Cows, and Sheep; the Middle-sort with a lesser Size; and the more barren with Sheep alone; the rocky with Goats, and the worst with Rabbits: For nothing is of greater prejudice to the Farmer than the stocking of his Land with Cattle, that are larger than it will bear.

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### Chap. III. *Of the Making of Hay.*

**W**HAT Up-lands you design for mowing, shut up the beginning of *February*; but your low Meadows and Marsh-lands you need not lay up 'till *April*, except the Spring be very wet, and your Marshes very poachy. Many feed them 'till the first of *May*, especially those that are in danger of over-flowing. In Spring let all the Sticks, Stones, and other Trumpery, be picked up, and the Mole-casts spread, because they will else hinder the Mowers: And if your Meadows lie any thing un-even, or have been poached in Winter, rowl them with a large wooden Roller; then the Mowers will be able to cut much the closer, and the Quantity of Hay will answer the Trouble.

For the time of mowing of Grass, it must be according to the Growth or Ripeness of it: Nothing is more prejudicial to your Crop than mowing of it too soon, because the Sap is not fully come out of the Root; and when 'tis dry, it shrinks away to nothing: Nor yet to let it stand too long, 'till it have shed its Seed, and that all the Sap is dried up, which only is the nourishing Part of it for Cattle; and therefore to know when Grass is fit



fit to cut, look carefully upon it, and when you see the Top thereof look brown, and begin to bend the Heads, and that the red Honey-suckle-flower begins to wither, which will commonly be about the Middle or latter End of *June*, you may conclude it ripe. As soon as your Grass is mown, if there is plenty of it, that it lie thick in the Swath, so as that neither the Air nor Sun pass freely through it, cause your Hay-makers to follow the Mowers, and to cast it abroad (except you fear wet; if you do, let it lie upon the Swath) this they call *Tedding* of it. At Night make it into Grass-cocks, the next Day as soon as the Dew is off the Ground, spread it again, and turn it, that it may wither on the other side; then handle it, and if you find it dry, make it up into Cocks. Next Day spread it again, and draw it into long Rows, which they call *Win-rows*, which is a convenient way to dry the Hay, and makes it easie to get together again, in case of Rain, to make up into large Cocks which will secure it from wet, though you let them stand a Day or two. Be sure, before you carry your large Cocks in, to open them once, and to spread them in the Sun, because 'tis apt to give in the Cock; and if any Rain happen to fall on your Hay, do not turn it 'till the upper-side be dry: For to turn the wet Grass to the moist Earth is the readiest way to rot it; neither open any of the Cocks, 'till the out-side of them is dry. Where thick leaved Weeds are amongst the Grass, they will need more drying than ordinary Grass doth; and when you have good Weather, put in all the hands you can, that you may observe the old saying, of making Hay when the Sun shines.

Mowing of Land too often and too long is a very great prejudice to it, except it be Land that is constantly mended with Water-floods: and therefore where you have not that Conveniency once in three

three Years, or every other Year, feed your mowing Lands, if you cannot get Manure constantly to keep them in heart. For feeding is as necessary for Hay-ground, as fallowing is for Corn-grounds. I shall not say any thing of After-crops, because I think them neither good for the Land, nor yet the Hay good for Cattle.

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#### Chap. IV. *Of several Sorts of Grass-seeds.*

I shall not say much for the recommending of these Grasses, because most by experience know their Profit; but only teach you how to manage them, and then describe their several Kinds.

In sowing of all Sorts of Grass-seed, let your Land be plowed more than once, to kill the natural Grass and Weeds, which else are apt to choke them; and they must be sowed after the Corn that you sow with them, so as to harrow the Land but once over after 'tis sown, which is best done with a Bush or a Gate stuck with Bushes.

##### §. 1. *Of Clover-Grass.*

*Clover-Grass.*

Of the several Sorts of these Kinds of Seeds, that which the Precedency is commonly given to, is the *Clover-grass*, for the great Improvement it makes upon Land, the Goodness of its Hay, and the Profit of its Seed, which most Authors give a very great Account of the Advantage of: But as they are silent about the Nature of the Land, that these great Improvements have been made upon, and of the particular Way of ordering of such Lands; so their Accounts are very short in respect to the particular Application that might else have been made to Lands of the same Kind: But the great Advantage of Clover is, that it improves Land by the great Quantity of Cattle it maintains,



tains, and fits it for Corn again in two or three Years time, it being one of the best ways of improving most Sorts of Lands, especially Clays, where Manure is scarce, and therefore much used in *Suffex* and other clay Countries.

Clover is of several Sorts; the great Clover is *Sorts.* reckoned the best, whose Seed is like that of Mustard, except in that it is rather oblong than round; the Choicest of which is that of a greenish yellow Colour, some of it a little reddish; but the black is not so good. Our *English* Seed is the best.

An Acre of Ground will require ten Pound of *Quantity.* Seed, and some Land twelve Pound; 'tis better to sow it too thick, than too thin: Some have sown a great deal more with good Advantage. It delights most in a rich warm Soil, and such Lands as are most Dunged, Marled, Limed, &c. as I shall shew hereafter. But the Clays that are long in swarding, and little subject to Weeds, are the best Land for Clover; because in those Lands that graze speedily the natural Grass eats it out, which all Sort of light Lands are subject to, and likewise to wash from the Roots of the Clover, so as to leave them bare, which gives opportunity to the Frost to kill it. But in the best Grounds it will not bear any thing of a good Crop longer than three or four Years.

The usual way of sowing of it is, either with Barly or Oats, after the Corn is sown, which 'tis best upon this Account, to sow something thinner than ordinary. The usual Time of sowing of it is *Time.* at the End of *March*, and in *April*, in a calm Day; but the best Time of sowing of it in dry Lands, is with black Oats, as forward in the Spring as you can, that so it may get up while the Rains last, before the dry Weather comes; some sow it with Wheat or Rye at *Michaelmas*, which gives it an opportunity of shedding of its Seed, and occasions  
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its growing thick and lasting longer; but then 'tis best sowed upon dry Lands that will bear sowing of both the Wheat and the Rye upon broad Ridges. This way 'tis most certain of taking, if it prove a mild Winter: But if hard Frost and great Snows come, 'tis very hazardous; though some advise the sowing of it alone at *Michaelmas*, which, they say, makes it come up freer from Weeds, than if sown in Spring, and will cause it to get strength enough to preserve it self against the Winter: And some sow Ray-Grass with the Corn at *Michaelmas*, and early in Spring sow the Clover, which they cover only by rowling of it. These ways are what I must confess I have not known the Experience of, but I am certain that the Frost will not hurt the Root, if it doth not lie bare, though it will spoil all the Grass; for which Reason most take care to feed it close before the Winter comes on.

*Mowing.*

About the Middle or End of *May*, you may cut the first Crop for Hay, which takes up more Time and Labour to dry than ordinary Grass, and will go very near together; yet if it grow not too strong it will be exceeding rich and good for the fattening of Cattle. The exact Time for the cutting of it is when it begins to knot. Some after the first Crop, mow two other Crops before Winter; but they seldom have Weather good enough to make the last Crop well; and therefore 'tis better to take but one Crop more, especially if you design it for Seed, which you must let stand 'till thorough ripe, for it will not be very ready to shed. When you first observe the Seed in the Husk, it will ripen in about a Months time more; and when the Seed begins to change its Colour, and the Stalk begins to die, and to turn brown, and be of a yellowish Colour, mow it in a dry Time, and preserve it as dry as you can: It ripens some Years sooner than others; and there-

therefore you must be guided by the Ripeness of it. If Clover is apt to wear out of your Ground, and you have a mind to continue it without new sowing, mow it the latter end of *May*, and let it stand about three Months till it casts its Seed, and then feed it with Cattle, and it will sow it self a Fresh, and come (as I am told) as thick as if new sown.

One Acre of this Grass will feed as many Cattle as five or six Acres of common Grass. Some reckon the best way to feed Cattle with it, is to put it in Racks, because of the great Quantity that they tread down with their Feet, and because it shrinks so much in drying.

Great care must be taken of the Cattle that are *Feeding*. first put into it, lest it burst them. To prevent which, some give them Straw with it, and some stint them as to Quantity; but the best way is only to turn them into it the first Day about Noon, when the Dew is off, and in a dry Day, for about half an Hour; the next Day for an Hour; the third Day for two; and then for three or four Days put them in as soon as the Dew is off the Ground, and let them stay in till four or five a Clock in the Afternoon, and after that there will be no danger, especially if 'tis not too wet Weather: If 'tis, be the longer before you let them stay in all Night. But some sow Trefoil or Ray-grass with their Clover, which very much prevents its doing of injury to Cattle; and as 'tis a Grass that grows very upright, it shoots through the Branches of the spreading Clover, and makes the Crop much better.

Your Clover being preserved dry, about the midst of *March*, thrash it, and cleanse it from the Straw as much as you can, and beat the Husk again; being very well dried in the Sun after the first thrashing, get what Seed you can out of it, and  
after



after you have thrashed it, and chaved it with a fine Rake, and dried it well in the Sun again, if you rub it you may get out a great deal more; Some get above two Bushels out of an Acre, a good thrasher can thrash out but about six Gallons in a Day. Some say that the best way of sowing of it is in the Husk; but 'tis something difficult to sow that way. The Seed of Clover will grow as well at two years old, as at the first. If one could get an Account from *Flanders* how they thrash their Clover there, it would be of great Advantage for the Propagation of it.

### §. 2. Of *St. Foin* or *Holy-Hay*.

*St. Foin* where it will grow is esteemed one of the best of these Sorts of Grasses, because of its long Continuance and Bulk: In many Lands it will last twenty or thirty Years: Besides, it improves the Land it grows on very much; for the Plowing in of the Roots is excellent Manure for it, which is what is not usual with these Sorts of Seeds. You may break up your Land, and sow it with Corn till 'tis out of Heart, and then sow it with *St. Foin* again. 'Tis reported to grow on any dry barren Land where hardly any thing else will grow; and the Roots running deep, and growing great, are not soon dried up by the parching Heat of the Sun; though 'tis reckoned to thrive best in a shallow Ground, because else in some Soils 'tis apt to run too deep: But I could never find it to grow upon any Soil in these Parts, except chalky Lands, as at *Royston* in *Hertfordshire*, where it grows upon the Miry chalky Clays, and upon the driest part of *Royston* Heath, which consists of dry chalky Hills. In some parts of *Dorsetshire*, they say it grows on very stony dry Hills where the Earth is not above half a Foot deep, its Roots running in between the Cracks of a flaky Lime-



Lime-stone, the Earth being a light Red-loam. Which makes me conclude it to do best on Land; that is sweet, Chalk and Lime-stone being both of a sweetning nature to Land; but I could wish that some particular Observations were made of the nature of the several Lands in the several Counties where it doth grow: For 'tis certainly one of the best improvements of Land that can be made use of where it will take, especially where Maturity is scarce.

It must be sown in far greater Quantities than the Clover-seed, because 'tis a larger, lighter Seed. They commonly allow four Bushels to an Acre. You need not fear sowing of it too thick, because it the sooner stocks the Ground, and destroys all the other Grass and Weeds. It may be sown alone, or with Oats, or Barly, as the other Grass-seeds are; but you must be sure to make your Ground very fine for this and all other Grass-seeds. Do not feed it the first Year, especially with great Cattle, because the Sweetness of it will provoke the Cattle to bite too near the Ground; and large Cattles treading of it is a great Injury to it, especially in wet Weather; and therefore 'tis best Mowing of it the first and second Year, and after that it will be out of danger.

The best Time for sowing of it is in Autumn *Time*, from the beginning of *August* to the end of *September*, if sowed alone; but if mixed with other Grain, in the Spring from the beginning of *February* till the end of *March*; the earlier 'tis sown in either Season, the better: And 'tis better to be sown alone, than with other Grain.

If you reserve it for mowing, it must be laid up by the latter end of *March*. The time of cutting of it is when it begins to Flower, which is about the middle of *May*, sometimes later. This Sort of Hay is very excellent for Horses.

It is the best Food for great Cattle, especially in the Spring. It hath not the danger attending of it, that Clover hath. It breeds abundance of Milk, and the Butter that is made of it is very good. If you feed it with Sheep, let it be in Autumn, and in the Winter: It fattens them very speedily.

§. 3. *La Lucerne.*

This is a Plant much commended for an excellent Fodder, and by some preferred before any other Sort, being to be managed after the same way with other Seeds of this Kind, and is reckoned to grow on any Sort of Land; but the Seed coming from *France*, this War-time hath prevented its being so much propagated as otherways it would have been; and therefore I cannot find those Observations made about it as yet, that might be expected. They sow twelve or fourteen Pound upon an Acre. The Time of sowing of it is about the Middle of *April*. It may be mow'd twice a Year, and fed all the Winter. The Hay must be well dried and housed, it being otherwise bad to keep. It is good for all Sort of Cattle, but best for Horses. It feedeth much more than the ordinary Hay, and causeth abundance of Milk, and must at first be used with Caution, and be mixed either with other Hay or Straw; you may also feed the: Grass, but if you mow it, 'tis best to do it but once a Year. It will last, as I am told, twenty Years. One Acre is reckoned to keep three Horses all the Year, if it takes well. It purges in Spring, and makes any Cattle fat in ten or twelve Days.

§. 4. *Of Ray-Grass.*

This Sort of Grass is reckoned to grow on any Land, but chiefly in cold, lowre, clayey, and weeping  
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ing Grounds. It endures the Summer-droughts, and the Winter-frosts, being the best of Winter-foods, and springs the earliest of any. The shorter it is fed, the better. There can be no danger of over-stocking of it, because if left to grow too rank, the Stalk is apt to grow Hard and Sticky. 'Tis best for Horses and Sheep, and very much prevents the Rotting of the Latter. Some sow two Bushels on an Acre; but the best Quantity is three Bushels, where they sow it with Clover, which is the best way of sowing of it. Where Land is proper for it, they sow eight Pound of Clover, and one Bushel of Ray-grass upon an Acre. It will last upon some Lands seven or eight Years. Some mow it for Hay, and thrash out the Seed, which commonly yields, about *London*, from two Shillings Six-pence, to three Shillings Six-pence *per* Bushel. Some tell you of five Quarters being got off of an Acre.

If Ray-grass-seed be cut something Green, it makes the best Hay, and the Seed will grow, but not so well as if Ripe; but you must take care, if the Seed is newly thrashed, that it do not lie Thick, because it will Heat.

#### §. 5. *Of Hop-clover, Trefoil or three-leaved Grass.*

This Sort of Grass is finer and sweeter than the great Clover, and upon some Land is a very great improvement, though 'tis reckoned to grow upon any Soil. Mr. *Hartlib* in his Legacy, says, that there are twenty three Sorts of it, and that each Sort delights in a particular Soil; as some of it in watery Places, some on dry, some on Clay, and some on Sand, which may give Occasion to most to reckon that it will grow on any Land. But there are many Sorts of Land that will bear but indifferent Crops of it, which many times may be

occasioned by the not suiting of it to the Land 'tis sown on. Concerning which, if strict Observations were made, I believe it might be much improved.

It may be sown with Corn, as Clover, and other Grass-seeds are, or alone only for Grass, or being sprinkled in Meadows, will mend the Hay both in Quantity and Quality. They commonly allow twelve Pound to an Acre.

#### §. 6. Of several other Grasses or Hays.

*Esparcet* is a Kind of *St. Foin*, and by some judged to be the same.

*La Romain*, or *French Tares*, or *Vetches*, is a Grain that in *France* is sown annually, and is very quick of Growth, being very good Food for Cattle, especially Horses; and after feeding of it the fore Part of the Summer, they let it grow for Hay. 'Tis not so good as the other Grass-seeds, because 'tis but of short continuance: 'Tis reckon'd to grow on very Poor dry Land.

*Spurry-seed* is usually sown in the Low-countries twice in a Summer, the first time in *May*, that it may Flower in *June* and *July*, and in *August* the Seed is usually Ripe. The second time of sowing of it is after *Rye-harvest*, which Grounds they usually Plow up, and sow with this Seed, to serve their Kine in Winter, when other Grass is eat up. It makes excellent Butter. Hens will greedily eat the Herb, which will, as *Mr. Hartlib* says, make them lay the better.

I am told that in *Buckinghamshire* they make good improvement of their Lands by sowing of them with *Parshy*, and that it prevents the Rot of Sheep; One in the Hundreds of *Essex* made a great improvement of some Land by sowing of it with *Mustard-seed* for the same use. But for these  
Sorts



Sorts of Seeds and many other things, I shall refer you to the Appendix, when I have got a farther Account of this and other Particulars, which I shall be obliged to any that will give us any assistance in the Information of.

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## BOOK II.

### Chap. I. *Of Arable Land and Tillage.*

**A** *Rable Land* is accounted a very profitable part of Husbandry if well managed, where a due Care is taken to suit each sort of Soil with right Seed and proper Manure, and that the Land is proper for Corn, in the Knowledge of which lies the chief Skill of the Husband-man, as was observed both by *Virgil* and the Ancients:

*But e'er thou break the unknown fallow, first  
Observe the Winds and Heavens still varying Face,  
Old custom with the Nature of the Place,  
What every Soil will bear, and what refuse.*

In order to the attaining of which Knowledge, I shall first begin with a Description of the *Plough*; as the chief Instrument in this Work; and secondly, give an Account of the way of Plowing, Sowing, and ordering of Land for Corn; and thirdly, shew how to order each Sort of Grain, and what Soil is proper for them; and fourthly, give an Account of the several Sorts of Soil, with their Natures and Qualities.

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### Chap. II. *Of the Plough.*

**T**Here is a great difference in most places about the Make and Shape of their *Ploughs*; some differing

differing in the length and shape of their Beams, some in the Share, others in the Coulter, and in the Handles, &c. Every place almost being wedded to their particular Fashion, without any Regard to the Goodness, Conveniency, or Usefulness of the Sort they use: And as some of them are more convenient in some particulars than others, and suit some Sort of Lands better than others, I shall endeavour to give a Description of the most usual Sorts of them, with an Account of the Advantage and Disadvantage of each Sort, which I think must be one of the likeliest Ways of improving this useful Instrument; in order to which, I shall first give you an account of what Sort of Ploughs are reckon'd best for each Sort of Land; secondly, describe several Sorts of Ploughs used in several places; and lastly, give such general Rules as may serve to direct you how to judge what Sort of Ploughs are best.

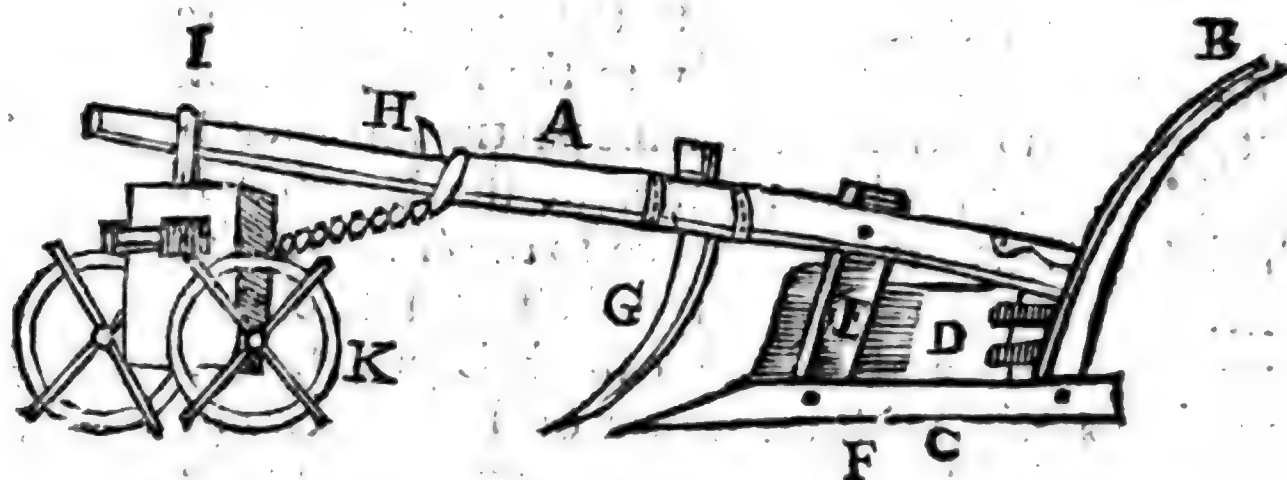
1. The Plough reckoned the most proper for stiff black Clays is one that is long, large, and broad, with a deep Head, and a square Earth-board, so as to turn up a great Furrow; the Coulter long and very little bending, with a very large Wing; and the Foot long and broad, so as to make a deep Furrow.

2. The Plough for the White, Blue, or Gray Clay need not be so large as the former, only somewhat broader at the Breech, the Coulter to be long and bending, and the share narrow with a wing coming up to arm and defend the Earth-board from wearing,

3. The Plough for the Red, White, Sands or Gravel, or any light Moulds, may be lighter and nimbler than the former, the Coulter more circular, and thinner, and the Wing not so large.

As to the particular Sorts of Ploughs used in several Countries, it would be endless to give a descri-

description of them all, and would be of little advantage; because the different Forms used, proceed more from the Custom of the Country, than any Usefulness that belongs to them; and therefore I shall confine my self only to the most common Sort, or to those that have some particular Usefulness belonging to them: Amongst the Number of which I shall give the preference to the *Hertfordshire* Wheel-Plough, as one of the best and strongest for most Uses, and of the easiest Draught, and what suits best with all Sorts of Lands, except miry Clays in Winter, which are apt to clog the Wheels at that time of the Year; but even for those Sort of Lands they are the best Ploughs to plow up Layes, or Summer Fallows with; because they turn the Turf best of any of the common Sort, and plow up Mole-hills, or uneven Ground without levelling, and Fallow-land in Summer in the dryest Weather. The chief Fault that attends them is their Handles standing sloping on one side, which makes them very troublesome to hold, and to follow; especially to those that are not used to them: But that might easily be remedied in the Make of them, were the Makers and Holders of them not wedded to their particular way; the Form of which Sort of Plough you have in the following Figure: And as I may often have occasion to name some particular Parts of them, I thought it might be convenient to shew what the Names of the particular Parts of the Plough are; as A is the Plough-beam, B the Handle, Tail, Stilts, Hales or Staves, C the Neck, or Share-beam, D the Earth-board, Mould-board, Brest-board, Furrow-board, Shield-board, &c. E the Sheath, F the Share-Iron, G the Coulter, H the Plough-pin, and Collar-links, I the Plough-pillow and Baulster, K the Wheels.

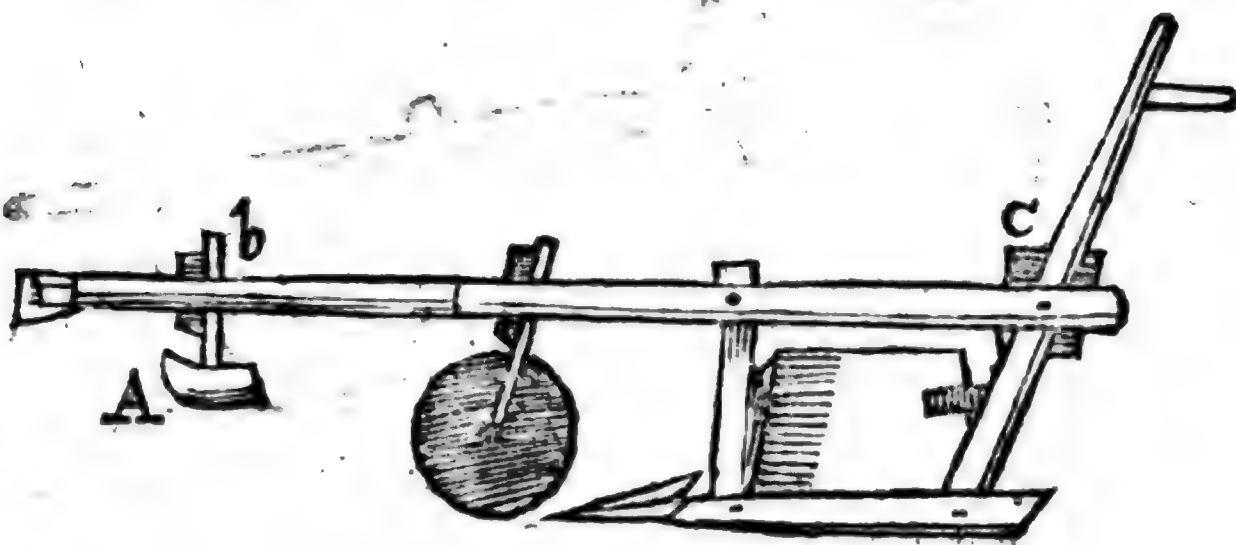


About *Colchester* they have a fine-light Wheel-plough, that with two Horses they plow up two Acres in a Day of their light Lands; which Sort of Plough is very peculiar for its Earth-board being made of Iron, by which means they make it rounding; which helps to turn the Earth or Turf, much better than any other Sort of Plough that I have seen.

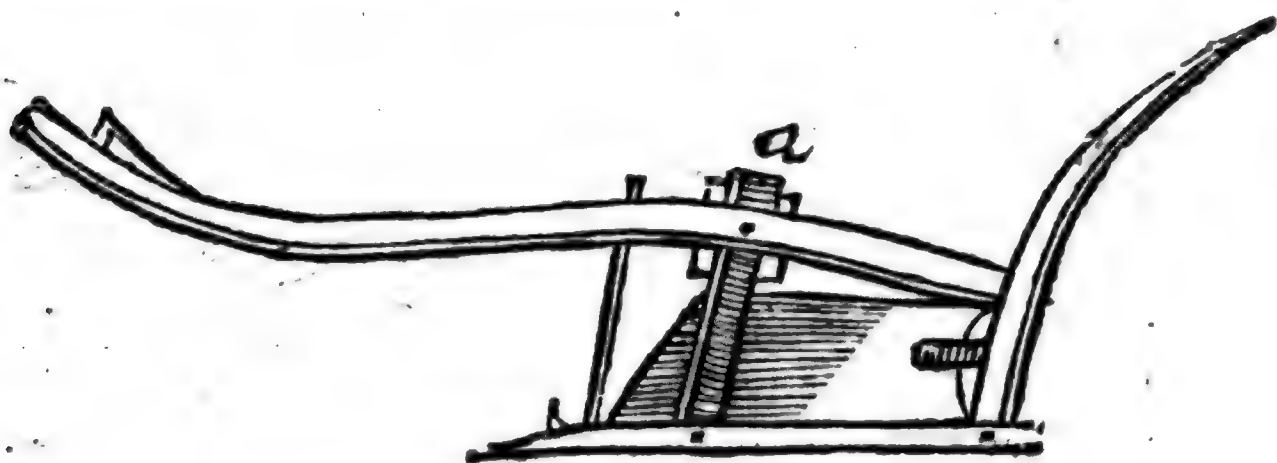
The *Lincolnshire* Plough is very particular in its shape, and is a very good Plough for Marsh or Fenny-Lands subject to Weeds and Sedge, and that is free from Stones, because of its Coulters, and the largeness of the Share which they make many times above a Foot broad, and very sharp; at A is a Foot which they set higher and lower with a Wedge at b, which keeps the Fore-part of the Plough from going deeper than they would have it: At C are Wedges that they set the Hind-part with; the Coulters is a sharp turning Wheel which cuts the Roots of the Grass or Sedge cros by its motion as it goes round, while the broad Share cuts the Bottom of their Roots.

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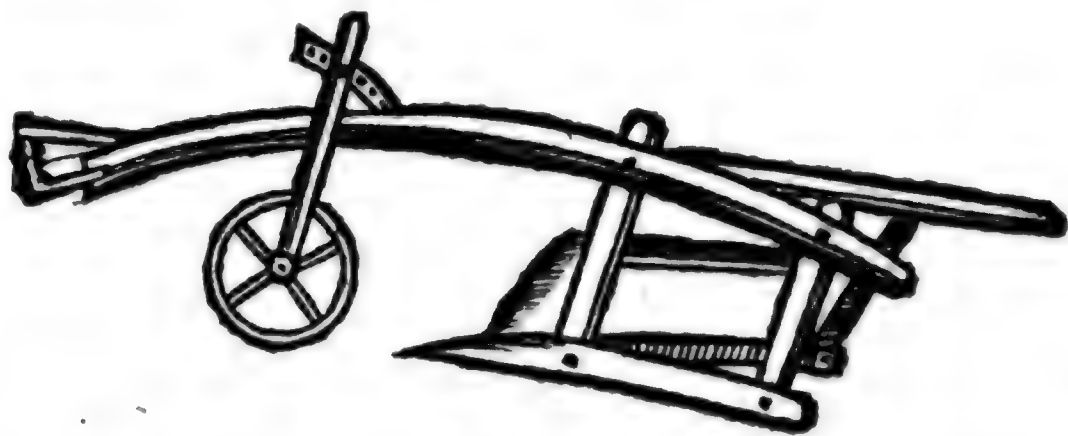


The most common Plough is the following called the Dray-plough, which is the best Plough in Winter for miry Clays, when the Land is soft; but the worst in Summer, when the Land is hard: Because the Point is always flying out of the Ground. This Plough is set higher or lower, as they find occasion, by Wedges at *a*, and differs but little from other Ploughs.

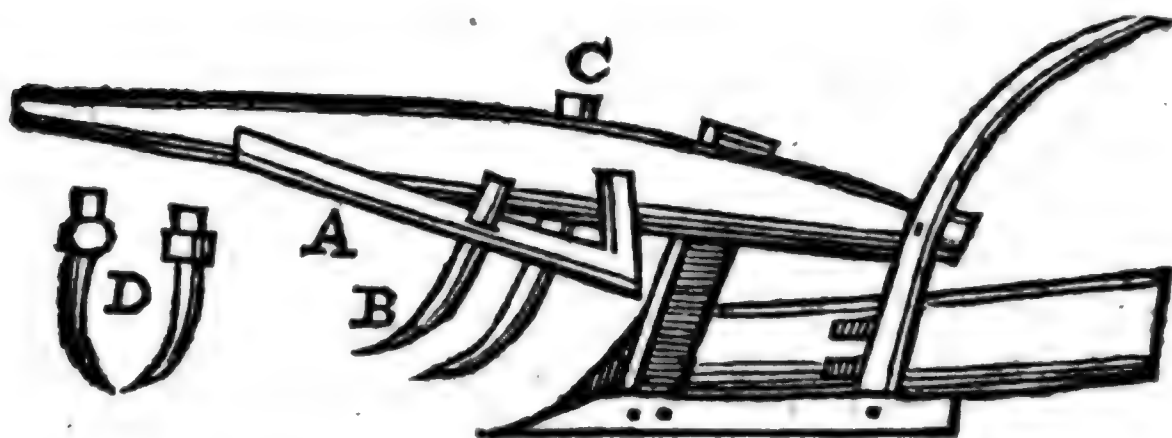


In *Suffex* they use much the single Wheel-Plough, which is a Sort of Plough I should not have mentioned, but for their different Make from most other Ploughs, because they are a very cloutery Sort; and as they are very wide in the Breech, I cannot but think the Draught of them to be very hard.

About



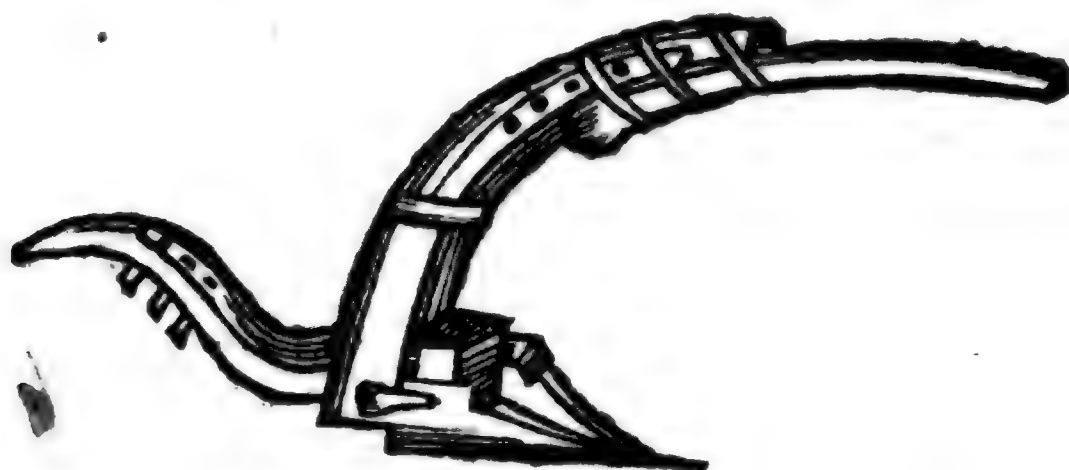
About *Caxton* in *Cambridgeshire* they have a very miry stiff Clay with small rising Grounds, the upper part of which they sow with Corn, and the lower Vallies, because of the poachiness of them, they keep for Grass, which nevertheless in wet Winters are so spewy, that they know not how to feed them; and to cut drains with Spades, they thought



would be very chargeable, and so they invented a Plough to do it with; which they made much like another Plough, only much stronger and bigger; and from the Beam stands out a piece of Wood at *A*, in which is a Coulter set at *B*, and another set in the Beam at *C*, which two Coulters stand bending inwards as at *D*, to cut each side of the Trench. The Share is very broad and flat, and cuts off the Bottom of the Trench. The Mould-board is three times the length of other Ploughs, to cast the Turf a great way off of the Trench. This Plough cuts a Trench a Foot wide at the Bottom,  
a Foot

a Foot and a half broad at the Top, and a Foot deep. It was drawn with twenty Horses, and cost three Pounds to make, but the dispatch it made answered the Charge.

The following Plough is a *Spanish* Plough, with one of which, and one Horse they will in *Spain* plow two or three Acres of their light Lands in a Day; because of the great difference there is in the Make of it from our common Sort, I thought the inserting of it might be of some use to help towards the Improvement of this useful Instrument.



As to the Rules to be observed in the shape of Ploughs: 1. They must be great or small, according to the depth and strength of the Soil you plow, and as the Earth is wet or dry: For which reason every Farmer ought to have several Sorts of Ploughs.

2. The Coulter where the Land is stiff must be the greater and the stronger, and go the deeper; which must be proportioned to the Soil, because in deep Grounds the Weeds root the deeper; for the better cutting up of which, some place on the right-side of the Coulter a small Wing or Finn, which cuts in two the Bottom of the Roots; and, I believe, eases much the Draught of the Plough.



3. A great matter to be observed in the making of Ploughs, is to make them go true to the pitch they are set, and to keep the Line you set them in without swerving to the right or left, which depends much upon the truth of the Iron-work; and therefore the Plough should rather be suited to the Irons, than the Irons to the Plough, the Wood-work being easiest altered, if there be occasion.

4. I cannot think a short Plough or a Plough with a broad Breech can go so easie after Cattle, as a long narrow one: For the sharper and thinner any Tool is, the easier it passeth, and the less strength is required: And such an one I believe may be made to turn a Ridge as well as a broader. But when all is said that can be, though the Make of a Plough doth much help Cattle's Draughts; yet the Main of the Draught lies in the stiffness of the Land you plow, and the Depth you go.

### Chap. III. *Of Plowing of Land.*

*Layes.* **I**N Plowing up of Land we are to consider:  
*First*, The plowing of *Layes*, which is the first plowing up of Grass-ground for Corn, and is a Work commonly done in *January*. The best Time for the doing of which is when the Land is wet, because the Turf then is tough, and will hold to turn without breaking; in the well turning of which consists the chief Part of this Sort of Plowing, which, if done well, will lay the Turf so flat and true, that you can hardly see where the Plough went. This depends much upon the Make of the Plough; for the well-doing of which, if the Earth-board doth not turn the Turf well, some nail upon it a small piece of Wood to take the upper Part of the Turf, as it rises upon the Earth-board,

board, which will cause it to fall over with the Grass-side downward, your own Trial and Experience being the best Rule where to place it.

*Secondly*, The Plowing of Fallows, which is a very great benefit to Land, as appears by the common Practice of it, and in the great Care that Landlords every where take to oblige their Tenants to a strict Observance of it once in three Years, few Lands being able to bear more than two Crops without it; and I cannot believe that any will find a Years fallowing to be a Loss to them, let their Land be what it will; nor yet the true plowing of it, a Charge that will not pay for their Labour. The Advantage of Fallowing consists in,

*First*, Its laying of the Land in Ridges, and so exposing of it to the Frost, Wind, Sun, and Dews, all which sweeten and mellow the Land very much; the often stirring of it, and breaking of the Clots, disposing of it for the bearing of good Crops.

*Secondly*, It kills the Weeds by turning up of the Roots to the Sun and Air, and kills not only the Weeds that grow with the last Corn; but wild Oats, Darnel, and other Weeds, that sow themselves, and that as soon as they begin to peep out of the Ground, so that they have no time to suck out any of the Heart of the Land.

The way of ordering of Fallows is after the Crop is off, to let the Land lie all Winter, and what Grass and Weeds grow on it, they eat off with Sheep in *April*, or beginning of *May*: As soon as they have done sowing of Corn, they begin to plow up their Fallows. This first fallowing in most places ought to be very shallow, well turned, and clapped close together; because the thinner the Turf is, the easier it will dry through, and kill the Weeds, especially if the Weather be dry: At which time one plowing

plowing is worth three other plowings. But in some places where there is a very cold Clay, that will not bear Corn well without being exposed to the Heat of the Sun to warm it, they plow their first Plowing the depth they design to go. About *June* is the Time of the second Plowing, which they call Twy-fallowing; at which plowing you must go your full depth: This plowing is commonly performed by the Team early in a Morning, before the Dew is off the Grass, that so they may have time to feed their Horses, before they go to carrying of Hay in the Afternoon. About the latter End of *July*, or Beginning of *August*, is the time of Try-fallowing, or last plowing before they sow their Rye or Wheat, (though some do plow up their Land oftner.) If the Land rise full of Clots, and if 'tis a binding Land, you must make it fine by harrowing of it when Rain comes; but then you must not let it lie long before you strick, rise, or plow it up into small Ridges, especially if 'tis wet Land: And as near as you can, leave no Weeds or Turfs of Grass un-killed or unbroke with your Harrows. Because it sours Land, and causes the Mould to lie hollow from the Roots of the Corn: But if your Land will dissolve well with the Frost, 'tis best to let it lie a little rougher, especially if you design to sow it with Barly, then the rougher it lies for a Winter-fallow the better, because it lies the dryer, and the Spring-showers will afford Moisture enough to make it fine for sowing: But if the Winter doth not dissolve the Clods, which it will not do in binding Lands, such as the red Loams are in *Essex*, which Lands they are often forced to wait for Rain for the fallowing of, because they plow only with the Dray-plough, the Point of which is always flying out of the Ground in dry Weather, by which means they are often forced to plow their



their Fallows six or eight times, which doth but seldom kill the Weeds; because plowing in wet Weather doth but remove them out of their places, and turn moist Earth upon their Roots, which makes them quickly grow again. I have often experienced that with the *Hertfordshire* Plough, I have in *Essex* made a better Fallow with three plowings than my Neighbours could with six or seven. Sometimes where Land is clotty, and a Shower of Rain comes that soaks through them, you may make use of a Roll to break them. In *Oxfordshire* they make their Rolls Octangular, the Edges whereof they reckon break the Clots better than the round ones; and in the Hundreds of *Essex*, where they have a very churlish blue Clay, they use large round Rollers which are stuck with strong Oaken-pins about three Inches long, and four Inches distant one from another in the Rows, and each Row twelve Inches asunder. But,

In *Hertfordshire* they always, if they can, plow in dry Weather, and harrow in wet, which makes the best Fallows; and always in fallowing of Land they plow one plowing cross the way, that they intend to lay the Ridges when they sow them.

In *Kent*, I am told, they have some Land so rich that it will yield good Crops of Corn for twenty Years together without fallowing, and that most of the Land that they fallow, they plow but once before sowing; nay, often, a Crop of Pease serves instead of it. In *Sussex* they plow their Fallows but 'twice; but I am satisfied that a well ordered Fallow would be of much more advantage to them: For if the Land do not need fallowing to enrich it, it will for to sweeten it, and to kill the Weeds, which fallowing gives the best check to.

Where

Where Land is but indifferent, and Manure is not to be got, fallowing every other year is found a great Improvement, and is a very ancient piece of Husbandry, as may be seen in *Pindar*, *Xenophon*, and *Virgil*, who advises to

*Let thy Land rest alternately untill'd,  
And to worn Grounds an annual cessation yield.*

Virgil. Georg.

In some places they take a Crop of Wheat and a Crop of Pease, and so fallow their Land again.

In *Staffordshire* they often give their Lands a Winter fallowing, besides the three summer fallowings, and lay their Land up in Ridges, when they sow Barly, which seems the way of the Ancients, by *Virgil*,

*The greedy villager likes best that Mould,  
Which twice hath felt the Sun, and twice the Cold.*

*Pliny* likewise commends much the Plowing of Land four times, but you must observe in Winter to harrow no more down than what you can quickly reer up again upon an Edge; because if much Rain come upon it while it lies flat, it will make it so poachy that you cannot Plow it, (especially if 'tis a wet Clay Land,) and cause it to breed Weeds; and therefore the best way in such a Case is to plow up in a Morning; and to harrow down in the Afternoon what you design to plow or strick the next day: Or you may harrow it in the Morning just before you Plow it. And if Land be weedy, by reason of the wetness of the last Summer, plow it up as soon as you can in Winter, to kill the Weeds, and to mellow it; some upon Lands that they design for a Fallow the next year with

with the last Crop of Corn, sprinkle four or five Pound of Clover upon an Acre, which serves them to feed at *Michaelmas*, and the next Spring till about *Midsummer*; at which time they begin their first fallowing, and in *August* they Plow it up into small Ridges, and so let it lie for a Winter Fallow, ordering of it for Barly the next Spring after.

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**Chap. IV.** *Of the laying of Land in Ridges, and the sowing of it.*

**S**OME in plowing up of their Lands, lay four Ridges together: In the Hundreds of *Essex* they lay six or eight Ridges together: in *Huntingtonshire*, and many other places where are very stiff moist Clays, they sow all upon broad Lands, raising the middle of the Ridges in some places near a Yard higher than the side Furrows, which certainly must drain those poachy Clays the best of any way; for the chief Design of laying Land in Ridges is the draining of it, and the making of the Corn to grow dry. But this way of laying of Land can only be done in a deep Soil, where the descent of the Ground doth not require the Ridges for the draining of the Land to be laid otherways; they chuse to have the Ridges to run *East* and *West*, because the Sun comes between them the better.

Be sure what Furrows you leave, to lay them open and clean scoured, so as to carry away all the standing Water and Moisture; and at all the lowest places make drains that may lead well into one another. Where the Plough will not make them deep enough, let it be done with the Spade: For in the well draining of Corn-lands, lies a main advantage: And observe in making of your  
E drains



drains both for Corn-land and Pasture, not to lay the Earth you dig out of them in Heaps or otherways near to them; but either let it be carried out at a distance from them by the Spade, or in Carts or Wheel-barrows, if 'tis Grass or fallow: And by this means you will constantly be lowering of your Land next the drains, which otherways will be treading in again, and always stopping of them.

If 'tis dry Weather in the Spring, that your Land should rise full of Lumps, the lying in the Air, if 'tis a binding Land, will sometimes cause them to grow so hard that you cannot break them, as I said before, without a great deal of Rain to moisten them, which may be inconvenient for you to stay for; in such Case, harrow it as you plow it up, but then, except it be very dry Land, you must speedily plow it up an Edge again.

Some sow their Lands under Furrow, as they call it; that is, they sow the Corn in the Furrow, and then plow a Ridge upon it to cover it; and some harrow their Ground over, and sow Wheat or Rye on it, with a broad Cast: Some only with a single Cast, and some with a Double, and then plow it upon an Edge in broad Lands where the Land is dry; and some plow their Land up an Edge for broad Furrows, and sow their Wheat or Rye on it, and then harrow it over: Either of these ways, but especially the latter, I believe to be better than the common way of sowing of Wheat and Rye under Furrow in binding Lands, and in shallow or very wet Soils, because it doth not bury the Corn so deep as the other way; for your Furrows should be deep or shallow, according to the depth of the Soil.

In cold Lands sow Wheat or Rye earlier, and in hot Lands later; but for Summer Corn, plow your poor Land first; but sow your cold Land last. Some mention very great Crops that have been

been gotten by sowing of Wheat in *July*; but they neither mention the Place, nor the Nature of the Soil it was sown upon; which are the principal things to be minded in all experiments of this kind, if they can be had.

In *Hertfordshire* they sow all their Barly with a broad Cast upon broad Ridges, and in *Essex* on small Ridges like Wheat, where they have two small harrows that clap on each side of the Ridge, and so they harrow it right up and down, and roll it with a belly Roll that goes between the Ridges, when they have sown it: But I think the large square Harrow the best; and if every Farmer had two or three Sorts, one a Degree finer than the other, I believe it might be a great help to them: For the well covering of the Seed must be of great Advantage.

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### Chap. V. *Of Sowing of Corn.*

**G**ET your Seed from a worse Soil than your own if you can; if not, 'tis better to have it from good Land, than not to have Change: For all Seed doth degenerate if long sown upon any Land, but most upon bad Land. This the Ancients were sensible of, as appears by *Virgil*,

*Your changed Seed delights the pregnant Plains,  
And Ground left fallow grants no little Gains.*

In the *South* part of *Staffordshire* they go to the *North* for Seed-corn; and they of the *North* to the *South*, except in the Moorlands, where they always choose to get the biggest Seed they can, because their Corn is apt to come to nothing, if not renewed from other Parts. But the having of Seed from the *Northern* Countries to the *South* is much the greatest Improvement, and the farther *North-*

*ward* the better, and the more will be the Advantage. The smallest Seed is reckoned the best, of Wheat, Rye, or Barly, if it be clean from Soil : But I believe they judge it so rather upon the account of the number of Grains that goes to fill the Bushel, than upon the Account of the produce. Variety of Seed is likewise an Advantage to Land, because every Sort of Grain draws and attracts from the Earth only its proper juice suitable to the Nourishment of its own Body : So that the sowing of the same Grain often exhausts and weakens the Ground by still attracting of the same Sort of juice, one Crop after another.

In sowing of Land great regard ought to be had to the Weather, and the Temper of the Land you design to sow, with the Sort of Seed you intend to use. Dry Land may be sowed in wetter Weather than Moist; especially if the Seed be what will bear Wet, or that the dry time happens against Winter, when you may be sure of Rain coming; as if you design to sow Rye or Wheat, the first of which Seeds cannot be sowed too dry, nor the other too wet, except 'tis so miry that the Plough cannot go, for which reason the Rye should be sown in dry Land and in dry Weather, and the Wheat in moist : and therefore it was that in *September* 1699, which was a very dry time, the Rye that was sown then did very well, and came up presently without Rain : But several sowing of Wheat at that time, because 'twas the usual time of doing of it, it lay in the Ground till Rain came, which was the latter end of *October* first, and then but part of it came up neither, because it was mustied and spoiled with lying so long in the Ground ; and what did come up was chiefly upon the sides of the Ridges, for the Ground was so dry that the Rain could not soak through the Top ; and therefore only reached to the Roots of the  
Corn



Corn on the sides that were but slightly covered : For which reason they having the whole Winter before them, I think that they had much better have staid longer for to sow their Wheat till they had had some Rain first : But all Summer-corn doth best in a dry time, except black Oats, which require more moisture, as I shall shew more at large hereafter.

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**Chap. VI. *Of Steeping of Corn.***

**W**Heat they commonly steep in Brine twelve Hours; and drawing the Brine from it, they mix it with unslacked Lime beat to Powder, and so sow it when dry, which is reckoned of great Advantage, and prevents the Smuttiness of it. Some others propose to drain Dunghills, or to dissolve Sheeps Dung in Water, and to add to it as much Salt as will make it a strong Brine, in this Liquor to steep your Corn ; Wheat eighteen Hours, Barly thirty six Hours, and Pease twelve, and to dry it with unslacked Lime powdered; and that if you put Wormwood into the Brine you soak your Corn in, it will prevent the Birds eating of it : But as my design is chiefly to promote tryed Experiments, so I shall not insist upon these things, but rather trust to what real Experiments I can get an Account of from such as are willing for a publick good to communicate them.

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**B O O K III.**

**Chap. I. *Of several sorts of Soils, their Natures, Product, and Management.***

**A**LL Sorts of Land may be reduced to Sandy, Gravelly, Chalkey, Stony, Rocky, Hazely, Black-earth, Marsh or Boggy, and Clay-land,



land, of which last some are Black, Blue, Yellow, and Red.

In many places several of these Soils are mixed together ; where they are, they are much better, than when alone, especially where the Hot and the Dry is mixed with the Cold and the Moist : For which reason any Clay laid upon Sand or Gravel, or Sand upon Clay is the best Manure, because it alters and changes the Nature of the Land it self ; whereas Dung and such things improve them but for a time. And 'tis not only the natural Soil that we are to consider, but the depth of it, and also what Soil is underneath it : For the best and richest Soil, if but half a Foot or a Foot deep, if it lie upon a stiff Clay or hard cold Stone, is not so Fertile as a leaner Soil of greater Depth, or lying upon a warm Limestone, Sand or Gravel, through which the superfluous Moisture may descend, and not stand upon the Clay or Stone to chill the Roots of the Grasse or Corn : And likewise the Climate is to be considered, for even in *England*, cold moist Clays are much more fruitful in the *South*, than in the *North*, with the Quantities of the Mixture of each Soil, and what it most abounds with : And likewise the natural produce of the Land as to Weeds and Grasse ; and when Plowed, what Corn agrees best with it, and what effect Plowing hath upon it : Concerning all which Particulars I have not had Opportunity of making so many Observations as I should have done ; but what I am wanting in at present, I hope by farther Endeavours, and the Assistance of those that are willing to promote good Husbandry, to enlarge upon. But before I enter into a particular Description of the several Sorts of Land, I shall first lay down some general Rules for the knowing of Fruitful and unfruitful Soils, and secondly give some general Rules for the ordering of Land for Corn.

All

All Land that moulders to Dust with a Frost, with all Sorts of warm Lands, Black Mould, Yellow Clays, if not too Spewy and Wet, and that turns Black after Rain, are good for Corn: For as old *Tusser* well observes,

*The Soil and the Seed, with the Sheaf and the Purse,  
The lighter in substance, for profit the Worse.*

And Land that produces large Trees, Black-Thorn, large Weeds, Thistles, rank Grass, &c. and that lies in Bottoms open to the *East* or *South*, being well sheltered from other Winds, is a Sign of fruitful Lands. Thyme, Strawberries Bettony, &c. direct to Wood, and Chamomil, to a Mould disposed to Corn.

All Land that binds after Frost and Rain, that turns White, and is full of Worms, that is extremely Moist or Cold, or too Hot or Dry, that lies on the *North* sides of Hills, exposed to cold Winds and Frost in Winter, and scorching Heat in Summer, that bears Holly, Yew, Box, Junipers, Ivy, Brakes, Furz, Broom, Heath, Ling, &c. and Lands that bear Moss, Rushes, Yarrow, Wild-tansie, Flags, &c. are a Sign of Cold Land; and Plants appearing Withered or Blasted, Shrubby and Curled, are the Effects of immoderate Wet or Heat, and cold interchangeably. Black, Dun, or Yellow Sand, and very hot stony Gravel are generally very unfruitful.

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**Chap. II.** *The general Rules for the ordering of Corn-Lands.*

**A**T the first Plowing up of Layes, they commonly sow the first Crop with White or Black Oats, according as the Land is Dry or Moist;

the next Summer they Fallow it; and as the Nature of the Land is, sow it with Rye, Wheat, or Barly; and the next Crop, which they call the Etch Crop, with Oats, Beans, Pease, &c.

But where Land is Rank 'tis not good to sow Wheat after a Fallow; but Cole-seed or Barly, or both, and then Wheat: and where you find dunging of Land makes it too Rank, lay your Dung upon the Etch, and sow it with Barly. Which generally doth better in Rich Land than other Corn; and after that, Fallow it, and sow it with Wheat.

Some after a Fallow sow their Land with Wheat; the next Year they Fallow it again, and sow it with Barly; the next Year with Pease; and then Fallow it again, and sow it with Wheat. This is a good way where Land is not in Heart, and Dung and Manure scarce, especially in the Hazely red Brick-earths in *Essex*, that are made more fixed and solid by plowing.

In *Staffordshire*, where they have very stiff Clays, after a Fallow they sow two Crops, and lay down their Lands with Clover and Ray-grass for three Year; and then lay on twenty Load of Dung upon an Acre; or else they Lime or Chalk it while it is Grass: This is a very great Improvement of stiff Clays, in that it fits them for Corn and Grass too; natural Grass being what they will hardly bear, if plowed up, unless they lie a great many Years, and are well Dunged.

### Chap. III. *Of the natural Produce, and way of ordering of several particular Sorts of Land in several Countries.*

**C**Lay-lands are either Black, Blue, Yellow or White; of which the Black and the Yellow are



are the best for Corn, and the White and Blue the worst; some of which is of such an obstinate ill natured Temper, that nothing will subdue it; and so greedy and voracious, that nothing will satiate it, without very great Industry. It turns every thing that is laid upon it to its own substance; and tho' some Clays are more pinguid, and others more slippery, yet all of them are very tenacious of Water on the Surface, where it stagnates and chills the Plant without penetrating; and in dry Seasons is costive, hardning with the Sun and Wind, 'till they are unlocked by industry, and rendred more kind, so as to admit of the Air and heavenly Influences. The chief Produce of these Lands for Corn, are Wheat, Barly, Gray-pease, Beans, &c. The natural Produce as to Weeds is Goose-grass, or Wild-tansie, large Daisies, Thistles, Docks, May-weed, Poppies, &c. Some of these Clays will bear good Clover and Ray-grass, if well dunged. The best Manure for them is Dung, especially Horse-dung, Ashes, Chalk, Lime, Soot, (especially if they are mossy) some Sorts of Marle, Folding of Sheep, Pigeons-dung, Malt-dust, &c. Clays hold Manure the best of any Lands, and yield the best Grain, especially where there is a Mixture of Lime-stone with it. They commonly sow these Lands at first breaking up with black Oats: Follow them as before described, and then sow them with either Wheat or Barly, and the Etch Crop with either Oats, Pease, or Beans, &c.

*Chalky Lands.* Their best Produce of Corn, is Barly and V Wheat; Oats will do well on them. Their natural Produce for V Weeds is Tine, Poppies, May-weed, &c. For Grass-seed, *St. Foin*, *Trefoil*, and if rich, *Clover*. The best Manure for these Lands is Rags, Dung, Folding of Sheep, &c. These Lands, if Rain happen to fall on them just after sowing, before



before the Corn gets up, will cause the Earth to bind so hard that the Corn cannot get through it.

In *Hertfordshire* they order these Lands for Corn the same with the Clays abovementioned. In *Oxfordshire* they commonly manure these Lands with half rotten Dung, which they say prevents the binding of it, and some mix it with Sand which causes it to work short, especially if any thing dry; they commonly sow them there with Wheat, Milsen and Barly; only after Wheat, they sow Pease or Vetches: In the sowing of which they are forced particularly to take care to have fair Weather, because of the Lands binding; but if they have but two Nights dry Weather, they will do well enough.

*Sand* and *Gravel*-Grounds easily admit of Heat and Moisture; for which they are not much the better, because they let it pass too soon, and so contract no Ligature; or retain it too long, especially where the bottom is of Clay; by which means, it either parches or chills too much, producing nothing but Moss or cancerous Infirmities: But if, as sometimes it happens, that Sand have a Surface of a more genial better Mould than ordinary, and a bottom of Gravel or loose Stone, though it do not hold the Water, it may produce a forward sweet Grass, though 'tis subject to burn; But it quickly recovers it self with the least Rain.

*Of pure sheer Sand.* There is White, Black, Bluish, Red, Yellow, Harsher and Milder, and some that is but meer Dust, that is very light; and the Gray, Black, and Ash-colour'd that is often found in heathy Commons, which is the most insipid of any. Gravels are much of the same Nature and Kind; only the most stony, or they that are mixed with harsh Sand, are the hottest and the most barren.

The

The best Produce of these Lands in Corn is Rye, white Oats, Brank-turneps, &c. The natural Produce in Weeds is Quitch-grass, Sorrel, Broom, Furz, Brakes, Ling, Heath, &c. Their best Manure is Marle, or any Sort of Clay that will dissolve with the Frost, Cow-dung, Chalk, Mud, and half rotten Straw from the Dung-hill, to prevent their binding. These Lands are commonly ordered for Corn as the Clays; but where any of them are over-run with Broom, Furz, &c. in *Staffordshire* they commonly marle them, which kills all that Sort of Trumpery; only the first sowing is with Buck-wheat, for which they make three Fallowings in Winter, and stir them in *May* following; at which time they sow them, allowing one Bushel to an Acre, which generally yields there sixty again: And so by once plowing up of these Lands, after the Crop is off, 'tis fit for to sow Rye on.

In *Oxfordshire* they seldom give these Lands above two Fallowings for Wheat, except they are much run-over with Weeds; of which Sort of Grain they reckon the White and Lammas Whear the most agreeable; and after a Fallow, Rath-ripe Barly, they generally fallow them every other Year, and reckon them unfit for Beans, or Pease, though they sometimes sow them with Winter Vetches; if with Pease, they account the Rath-ripe Pea the best. These Lands must be constantly fallowed.

In *Hertfordshire* they make a very great Improvement of sandy Lands that are much given to Moss, by burning of the Moss, and mixing of the Ashes with Lime, and plowing of them up. They sow them with Rye which yields a mighty Increase, and brings a very good Sort of Grass upon them, when laid down after a Crop or two.

*Stony*

*Stony Lands* are either such Lands as are full of Flints and large Pebbles, or Lands that have a Mixture of Free-stone, Marble or Lime-stones; the Produce of which is much according to the Nature of the Earth they are mixed with: Where the Stones are of a cold Nature, 'tis good to pick them out; but in light dry Soils, they are to be left.

In *Oxfordshire*, where they have a lean Earth and a small rubble Stone, or a sower Sort of Land mixed with it, they manage it according to its being full of Grass and Weeds, or its being clean. If they are weedy, they fallow them late; but not so late as sower Grounds: If they be scary, as they call it, that is, if they have no sward upon them, either they fold them in Winter, and add to the Sheeps-dung some Hay-feed to make it Grass; or else they lay old Thatch or Straw, and Dung upon it: For they reckon if these Sorts of Lands have no sward on them before they are fallowed, they will by no means bear a Crop, but a great deal of May-weed, &c. In *September*, *November*, and *December*, they fallow as the Sward directs them: If 'tis done in either of the two last Months 'tis called a Winter fallowing, which they never stir again 'till they plow it up and sow it with Barly; and these Lands are reckoned to do better than if finely tilled: They will bear Wheat and Meslin in a kindly Year, and good Barly if kept in heart. They fallow these Lands every other Year, except they sow Pease on them. Sometimes they are sown with Dills or Lentils: When they are quite worn out, they lay them down with Ray-grass and Trefoil: But the common stony Lands they order much as the Clays.

*Red Hazely Brick Earth*, that they have in many places in *Essex* (which is more properly I think a kind



kind of Loam ) being like red Clay, only it differs from Clay in its binding Quality, and in that it lets whatever Rain falls on it to sink through immediately, and in that it hath no Stones in it : Whereas all Clays hold the Water that falls on them 'till the Sun and Air dries it up, and after Rain with a Frost moulders to dust, and have Stones mixed with them ; these Loams are an excellent Mixture with other Sorts of Earth, being an excellent Mean between other Extreames, uniting what is too loose, cooling what is too hot, and gently entertaining the Moisture. The best Produce of these Lands in Corn is Rye if well dunged, Barly, white Oats, Buckwheat, Turneps, Wheat and Pease, if well chalked, marled, or mixed with Clay. Its natural Produce of Weeds is Broom, Fern, Quitch, sowre Grass, and almost all Sorts of pernicious VVeeds. Of Grass-seeds, Clover, if well dunged, and Ray-grass; but the Clover quickly wears out of it. The best Manure for these Lands is Chalk, and Sea-coal-ashes. Marle makes a mighty Improvement of them, and a stiff yellow Clay that moulders with the Frost, that in many places lies under it, being full of small Chalk-stones, Lime, Horse-dung. Burning of this Land and mixing of the Ashes with Chalk, I believe, would be a very great Improvement of it. VVhat amendment you bestow on this Sort of Land, with Dung, or other Sort of Manure, that doth not change the Nature and Quality of it, lasts but a little while.

These Lands bind very much after Rain, and turn very white; no Frost will dissolve the Clod; and if they are new plowed up, and never so much Rain comes on them, you may walk or ride on them as firm almost as on a Gravel: These Lands are very subject to VVorms, which destroy both the Corn and the Grass very much, especially the VVinter-corn, if they are not often plowed.



plowed. They run much to Grass and Weeds, and the Corn very much to Straw, and yields but little Corn in wet Years: They graze well the next Year after plowing, nothing being a greater Improvement of them than plowing; because it makes them solid, and sweetens them so that instead of a sower rank Grass, it makes them bear a sweet Hony-suckle. These Lands are ordered for Corn as the Clays; only as they are rank Lands, and run much to Straw; so 'tis best to dung them upon the Etch Crop, and to sow them with Barly, and never to dung the Fallows. But where you have not a mind to plow these Lands up, and find the Grass on them sower and full of Weeds mow them one Year, and keep them short fed with Sheep, which improves and sweetens them very much.

In *Oxfordshire* they have a Sort of red Land which they begin fallowing as soon in the Year as they can, before the Sun is too high: If 'tis moist when fallowed, so 'tis not too wet, they esteem it the better: They seldom give it a second stirring, and reckon that if 'tis too fine and light, that it occasions its running to May-weed, and other Trumpery; a Mixture of Cow-dung and Horse-dung and Folding of Sheep, they reckon the best Manure for it; they sow Wheat, Messin, Barly and Pease, on it, and fallow it every other Year.

*Heathy Land.* In *Kent* they cut up the Heath in May, and when 'tis dry, burn it and spread the Ashes, and then plow up the Turf with a broad finned Plough, which they burn likewise, and mixing of the Ashes with Lime and Sea-sand where to be got, they spread it, and upon all lay a good Quantity of Dung. About the latter End of September they sow it with Wheat for three Years, the fourth

fourth Year with Barly, being folded with Sheep : The fifth, sixth and seventh with Oats, and the eighth with Pease ; and after that it will bear very good Grass.

In *Staffordshire* they stock up the Heath in Summer, and burn it, mixing the Ashes with Lime, allowing four Load to an Acre, each Load containing four Quarters, which they plow under Furrow about the Middle or the latter End of *September*, or beginning of *October*. They sow it with Rye, allowing two Bushels to an Acre, the Increase of which is commonly twenty five Bushels. After Rye they sow Barly, in order to which they make three Fallowings, one in *October*, one about *Candlemas*, and another in *April*, which yields much the same Quantity as of Rye. Next to Barly they sow white Pease, for which they plow but once in *March*, allowing three Bushels to an Acre : After which they sow Oats, either white or red, if the Land is in heart ; if not, black, for either of which they allow but one plowing in *March*, and then they lay it down for Grass.

*Gouty, moorish, peaty, cold, black, Land.* This Sort of Land in *Staffordshire* they order much the same way with the heathy Land, only they burn it deeper ; but it bears little but Oats ; white Oats upon the gouty, and black Oats upon the black cold Lands : The Turf of these Lands burnt and carried upon Rye or Barly-lands they reckon a better Improvement than Dung.

*Black Mould* that is somewhat Fat, yet porous, light, and sufficiently tenacious, without any Mixture of Gravel, or Sand, rising in gross Clods at the first breaking up of the Plough, and sheldring with the Frost, is good Land, both for Corn and Grass : Which, opinion the Ancients had of them, as appears, by *Virgil*, who says that *Black*

*Black Grounds which under heavy Ploughs are rich,  
A brittle Soil ( for Tillage makes it such )  
Is best for Corn, upon no Ground appears  
More Wains returning home with weary Steers.*

But as these Sorts of Lands are mostly in bottoms; so the Wetness of them often spoils them for Corn: But where they are dry, they are extraordinary fruitful, especially for Barly; they will bear also good Wheat upon the Etch Crop: But if they are very rich, that you fear lodging of the Corn, you may, if a deep Mould, plant them with Liquorish, or sow them with Hemp, Oad, Cole, Rape-seed, or Madder, or some other rich Commodity, that best agrees with rich Land; and afterwards with Corn, when some of the Fertility is abated. The natural Produce of these Lands is commonly Thistles, Docks, and all Sorts of rank Weeds, and Grass. It will bear excellent Clover. The best Manure is Chalk, Lime, Dung, &c.

Where Lands are sowre, the best Way to sweeten them is to chalk them well where 'tis to be had, while they are Grass; letting of them lie for one Year or more, and then plowing of them up, give them a good Fallowing, especially in a dry Time in Summer, which will kill the Quitch, Sorrel, Moss, and other Trumpery, that these Lands are subject to, and mellow them the best of any thing; also Soot, Ashes, Dung, and Marle, will sweeten some Sort of Lands.

In *Oxfordshire*, I am informed, they give their sowre Land a tilt, according to the State and Condition of their Lands; if it have a great deal of Grass, they fallow it when the Sun is pretty high, which they call a scalding Fallow, which kills the Grass-roots, and makes the Land fine; if 'tis light and have but little Grass on it, they plow it early  
in



in the Year, and then there will come some spinny Grass that will keep it from Scalding in Summer; for if they suffer it to scorch when light, they reckon that all they can do will not procure a Crop. But, as I know not the Nature of this Land, so, I can give no reason for their Management of it. They likewise reckon folding of Sheep very good upon these Lands; and if they lay Dung upon them, 'tis commonly before stirring. But Pigeons Dung and Malt-dust they reckon the best, because they are cold Lands which they both Plow and Sow in with the Corn, to keep the Roots of the Corn warm; only they observe not to Plow or Sow it in very wet Weather.

Thus I have given an Account of several Sorts of Land, and of several ways of managing of them, in hopes that others will help me with what they can pick up of this Nature, which I design to add by way of Appendix, as I promised in the Beginning, which I cannot but think will be of very great use to the Improvement of Husbandry; because by this means every one will see the distinct methods used in several Places, and the Reasons of their so doing: But then I must desire all to be very particular in describing of the Land they send an Account of; and if they please to send their Names, that we may know how, if there be Occasion, to send such Questions to them as may be needful for the making of a true Judgment of Things, it will still add to the Advantage that may be made of this Method.

I shall conclude this point with giving an Account of an Experiment of Mr. *Houghton's*, to know what Quantity of Sand any Earth or Marle is mixed with, which may be of use to try the Nature of several Sorts of Land by. He took a Piece of Clay, such as the Brewers stop their Casks with, which is commonly a Sort of Yellow Tyle-clay,

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which



which weighed four Ounces and a half Averdupois, this he dissolved in Water, and poured off the thick into another Bason, till all was gone but the Sand ; which stuck not together, but lay loose in the Water, and when it was dry would run like Hour-glass-sand, of which he had about the Quantity of an Ounce, being of a yellow Colour, and something glistning, and some little Stones and other foul matter was with it ; and when the Clay was settled, he poured off the Water, and left the rest to dry in a Pewter-Bason, which hung together, only 'twas full of Cracks.

He tryed likewise Fullers-earth, which left a thick Settlement, and when dry would easily break to Powder ; but he could find no Sand in it, neither by the Microscope, nor any grittiness by rubbing of it between his Fingers.

## BOOK IV.

### Chap. I. *Of Manuring, Dunging, and Soil- ing of Land.*

**H**AVING given you an Account of the way of ordering of Meadows, Pastures and Arable Land, with several Sorts of Improvement of them ; I shall in the next place proceed to give an Account of the several ways used to improve Land by Manure, Dung, and other Sort of Soils.

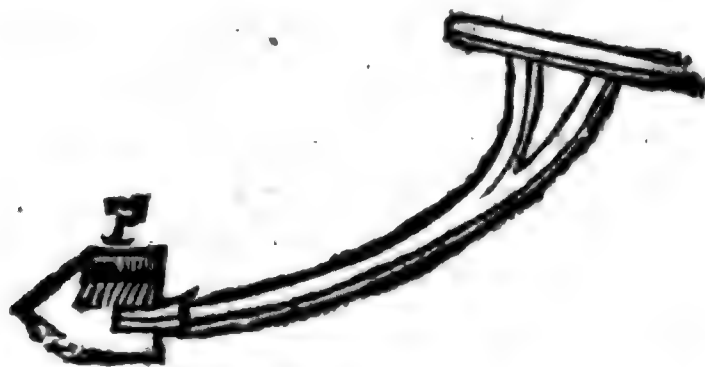
### Chap. II. *Of Burning of Land.*

**B**URNING of Land is not only a very great, but a very ancient way of Improvement, the heat of the fire warming of the Land wafts the  
acid,

acid, steril Juices, that hinder the Fertility of it, and leaves a Salt upon the Ground, in which (being mixed with the Ashes) the fruitfulness consists.

Burning of Land or burn-beating, commonly called *Denshiring*, (that is, *Devonshiring* or *Denbighshiring*, because most used or first invented there,) is not proper for any rich Soils, or dry stony Lands, or Chalky Clays; nor is it a thing too often to be repeated on any Soil, especially where the Soil is shallow; nor must Corn be sown too long on such Lands: For burning wafts the fertil Juices of the Land, as well as it abates the bad: And therefore is most proper for those Lands that have lain long untilled, and have contracted a sowre Juice which causes the Land to run to unprofitable Trumpery; as sowre Grass, Quitch, Rushes, Heath, Gors, Fern, Broom, &c. and Land that runs too much to Straw, and yields but a lank short Ear, whether such Lands be hot or cold, wet or dry; of all such Lands, burning is a very great Improvement, causing some poor Lands in two or three Years time, to yield as much as the Inheritance is worth.

The usual Method of plowing of it is with the Breast-plough which a Man thoves before him, made after the following Manner. At *p.* is a little Edge



turned up, that cuts the Turf off from the rest of the Green-sward, by means of which, when the Turf is cut about a Foot and a half long, they turn

it over the cutting Iron, being about eight or nine Inches long. With this Plough they pare the Turf about half an Inch thick, except the Land is very full of Strings, Roots, or combustible Matter ; then, if 'tis pared thick, 'tis the better ; which they turn over as they cut it, that it may dry the better : If it proves a dry Season, and the Weather hot, it will need no more turning : But if wet, they raise the Turfs and set them a little hollow. Some reer them on Edge, and to make them stand, set them winding like the Motion of a Serpent's going, which gives opportunity to the Wind, and Sun, to dry both sides : When they are dry, they commonly lay about two Wheel-barrows full to an Heap : But the lesser the Hills are the better, provided there be enough to make such a Fire as will thoroughly consume the Heaps to Ashes. If the Turf be full of Roots, or have a good head on it, or if it be in a deep Soil, that you may cut it pretty deep, it will burn without the Addition of any other Fuel : If not, they raise their Heaps on a small bundle of Ling, Furz, Brakes, or such like Fuel, to set it on Fire. These Hills when burnt they let lie till they are a little sadned with the Rain, before they spread them ; which they commonly do in a calm time, or after Rain, that the Wind may not carry away the Ashes, nor hinder the equal spreading of them, and they pare the Ground under the Hills somewhat lower than the Surface of the Earth to abate its over great Fertility occasioned by the Fires burning of it. This Land must be but shallow or half plowed, not above an Inch below the depth of the Ashes, and not much above half the Quantity of Corn you sow on other Lands sown on it, which they reckon best sowed late : If with Wheat, about the latter end of *October* is best, because of preventing the over-rankness of it.

These

These Lands they commonly cut the Turf off in *May*, or any time in the beginning of Summer; but the sooner the better; because of having time to bring the Land into order. The Charge of cutting of the Turf, carrying of it on Heaps, and burning of it, is commonly done for twenty four Shillings *per Acre*, where Men have one Shilling four-pence *per day* for their Work.

In burning of the Turf you must take care not to over-burn it; 'tis only to be burnt so as may make it break and spread well; for the over-burning of it to white Ashes, waists the Nitrous Salt: And though the middle part of the Hills will be more burnt than the outside; yet by keeping of the Fire from breaking out, and by laying of combustible matter on the outside, you may fix the Salts in all parts of it, which is best done by a slow Fire.

Some stub up Furz, Broom, Heath, &c. and lay on Heaps, and when dry cover them with the Parings of the Earth, and burn them; others burn their Stubble on the Land, and others gather either Stubble or any other Trash they can get into Heaps, and burn them; and to every Heap or Hill of Ashes some put a Peck of unslacked Lime which they cover with the Ashes, and let it stand till Rain comes to slack the Lime, and then they spread the Ashes and Lime together. 'Tis observable of this Sort of Improvement, that it tends most to the Increase of the Product; whereas other Manure, as that of Dung, &c. increases rather the Substance of the Straw, and breeds Weeds, than the Quantity of the Grain or Fruit: Though I cannot but think, that if some Dung be laid on these Lands at the Plowing of them up for a second or third Crop of Corn, which ought to be the time for laying of them down for Grass, that it will be of Advantage to them, especially if they are of the poorest Sorts of Lands.



Chap. III. *Of Chalk.*

**C**Halk is of two Sorts, the hard dry strong Chalk, which is the best for Lime ; and a soft unctuous Chalk, which is the best for Lands, because it easily dissolves with Rain and Frost. 'Tis a very great improver of most Lands, and will alter and change even the very Nature of them, especially such as have not been chalked before ; For 'tis apt to cause Land to put forth it self too much ; and therefore Land that is Chalked, if 'tis not well dunged and kept in heart, will receive but little benefit from a second Chalking, unless it lie a great many Years to recover it self, except it be some very particular Sort of Land, which is the Occasion of that saying, That Chalk makes a rich Tenant, and a poor Landlord. For which Reason the best way of making Improvement by it, is to mix but one Load of Chalk with two or three Load of Dung, Mud or fresh Earth, which will make it a constant Advantage. 'Tis best for cold, sowre Lands, and commonly makes the greatest Improvement on those Lands that lie farthest from it ; because the Lands near it partake, and have too much of the Nature of the Chalk in them. They commonly lay twelve or fourteen Loads of Chalk upon an Acre, where they lay it single, which will upon some Lands cause extraordinary Crops of Corn, for fourteen or fifteen Years together. 'Tis best to carry the Chalk on upon a Laye, a Year or two before you Plow it up, because by that means it will sweeten the Surface of the Earth, and work not so much downwards, as it will if plowed up at first. It makes Corn to yield well ; and where 'tis laid upon Grass-ground, it will not so much increase the Bulk of it, as it will make the Grass Sweet, so as to cause Cattle

Cattle to fat speedily, and Cows to give thick Milk.

They have in *Kent* a pretty way of saving of Labour in the digging of Chalk, where they dig it upon the sides of Hills, by undermining the bottom of the Chalk, so far as they would have it fall, and upon the Top so far as they have undermined the bottom, they dig a small Trench which they fill with Water, which in about a Nights time will soak to the bottom, and cause a flake from top to bottom to fall the breadth of the place undermined, which saves a great deal of Labour and Danger. But as Chalk in most places lies a great depth under the Earth, they there commonly dig for it in the same manner as the Miners carry on the Shafts of their Mines, and draw it up with Buckets, in which places they commonly sell it for Six-pence or Four-pence a Cart-load, according as it lies in depth, where Men have one Shilling and Two-pence *per* day for their Work, according to which Price I shall make all my Calculations.

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#### Chap. IV. *Of Lime.*

**L**ime is commonly made of Chalk or of any Sort of Stone that is not sandy or very cold, as Free-stone, &c. All Sorts of soft Stone, especially a grey dirty coloured Stone, that if you break it will yield a white Powder; and all Sorts of Marble, Alabaster, Slate, Oyster and all Sorts of Sea-shells, and all Sorts of Flints, will make an extraordinary Lime (but they are hard to burn, except in a Reverberatory Kiln, because they are apt to run to Glass,) for the harder the Chalk or the Stones are, the better is the Lime; only they require the more Fire to burn them: Both Sorts may be burnt with Wood, Coals, Turf, or Fern which makes a very hot Fire.

The Kilns used for Chalk or Stone they commonly make in a great Pit that is either round or square, according as they have conveniency, and big according to the quantity they burn, which they make wide at the Top, and narrow by degrees, as they come nearer to the Bottom: The In-side of this Pit they line round about with a Wall built of Lime-stone; at the Out-side near the bottom, they have a hole or door by which they take out the Ashes, and above that some have an Iron-grate, which cometh close to the Wall round about; but others arch it over with Stone or large Pieces of Chalk; and upon this they lay a Layer of Stone, or of what else they burn in the Kiln, and upon that a Lay of Wood or Coals, &c. which they repeat 'till the Kiln is full; only they observe, that the outmost Lay be always of Wood or Coals, or what they burn their Lime with, and not of what they make their Lime, to which they give fire at the hole underneath. Chalk is commonly burnt in twenty four Hours, but Stone often takes up sixty Hours: Ten Bushels of Sea-coal, or a Hundred of Faggots three Foot long will burn forty Bushels of Chalk, and forty Bushels of Chalk will yield thirty Bushels of unflaked Lime. Where Chalk is scarce, you may take the Chalk-rubbish and mix it with Water, working of it together as you do Clay for Bricks, which put into Brick-moulds, and drying of it burn it, and it will make as good Lime as other Chalk. But the Stone-lime is much the best for Land, and indeed for all other Uses; which in many places they carry out upon the Land, and lay in heaps, allowing a Bushel to a Pole-square, or a hundred and sixty Bushels to an Acre, which they cover with Earth, letting of the Heaps lie 'till the Rain slacks it, and then they spread it: But they reckon that if 'tis carried out upon the Land hot from the Kiln, that 'tis best; and that it doth best upon light sandy



sandy Land, or a mixed Gravel, and that wet or cold Gravel or Clay are not good for it. Dung, Mud, or fresh Earth mixed with it makes an extraordinary Manure, and is the best Way of ordering of it for Land that is sandy or gravelly. I am told that a Parcel of sandy Ground in *Westmorland* produced an extraordinary Crop of Barly and other Corn, being manured with Stone-lime and Cow-dung mixed together. The Nature of Lime is to work downwards, like Chalk, and therefore 'tis best laying of it upon a Laye the Year before you design to plow it up. Lime is reckoned to make Corn grow with a thin Husk; but 'tis not a lasting Manure, it seldom holding above five Crops.

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### Chap. V. *Of Marle.*

**M***arle* is of several Sorts. In *Cheshire* they reckon five Sorts. *First*, The Cow-shut-marle, which is of a brownish Colour, with blue Veins in it, and little Lumps of Chalk or Lime-stone. *Secondly*, Stone or Slate-marle, which is a Kind of a soft Stone, or rather Slate of a blue or bluish-red Colour, that easily dissolves with Frost or Rain. *Thirdly*, Peat-marle or Delving-marle which is close, strong and very fat. *Fourthly*, Clay-marle which resembles Clay, and is near a-kin to it, but is more fat, and is sometimes mixed with Chalk-stones. *Fifthly*, Steel-marle, which is commonly in the Bottom of Pits, that are dug, and is of it self apt to break into square cubical Bits.

Mr. *Markham* reckons in *Suffex* four Sorts of Marle, a Grey, a Blue, a Yellow, and a Red Marle; the Blue is reputed the best, the Yellow next, and next the Grey; but the Red is less durable; the Goodness of which is not so much known by the Colour as the Purity and Uncompound-

poundedness of it: For if it will break into bits, like a Dye, or into thin Flakes, or is smooth like Lead-ore, and without any Composition of Gravel or Sand, it will slack like Slate-stones, and shatter after wet, or being exposed to the Sun and Frost, will turn to Dust; or when thorough dry, will not hang or stick together like tough Clay, but is fat and tender, so as to open the Land 'tis laid on, and not to bind it, you need not question the benefit of it. In *Staffordshire* they esteem the Dice or Slate-marle better than the Clay-marle, and reckon the Grey best for pasture, and the Blue for arable Land. A great deal of the Marle in the *North* Country, runs much upon the Loam; but that in *Sussex* is more like Fullers-earth; and therefore must certainly be the fattest. I reckon Marle much of the Nature of Chalk, and am told by a Potter that when-ever they meet with any Chalk or any Sort of Marle mixed with their Clay, though it will with the Clay hold burning, yet when-ever any Water comes near any such Pots after they are burnt, that both the Chalk and Marle will slack and spoil their Ware. I saw a Sample of Marle from *Derbyshire* that was a very fat Marle, though it had so great a Quantity of Sand in it, that it was so short that if you wet it, you could not work it into a Ball, or make it hold together; this sort of Marle did very well upon Clay-lands, though contrary to the old Saying:

*That he that Marles Sand may buy Land,  
He that Marles Moss shall suffer no loss,  
But he that Marles Clay flings all away.*

Because 'twas of a hotter Nature than commonly Marle is, and of a more opening Quality; Marle's binding and sadning of Land being the great Prejudice that it commonly doth to Clay-lands, as I said before: And though some Marle is fat, and something

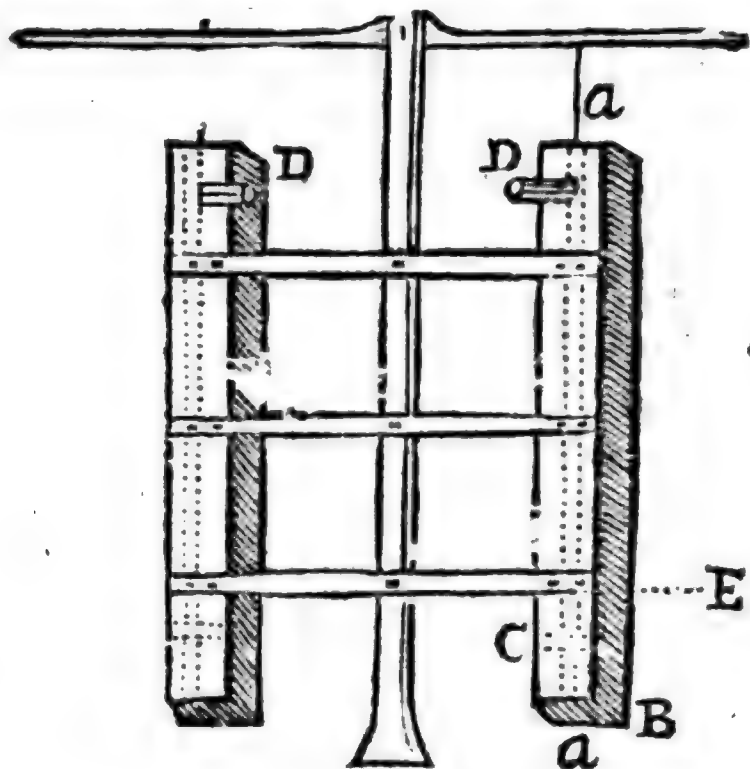
thing more opening than other Sorts of it, yet the generality of it is of a cold Nature, and will be bound down by the Weight of the Clay; and therefore commonly suits best with warm hot Lands. But as there are no general Rules without some exceptions; so where Marle is not laid too thick, nor is of a too tough binding cold quality, it will often mend Clays; especially Grazing-ground, as I shall shew hereafter: For in the suiting of the Land and Marle together lies the chief Advantage; and therefore the best and surest Rules to know the Richness and Profit of Marle by, is to try a Load or two upon each particular Sort of Soil that you have, and in different Proportions.

Cow-shut or Stone-marle is commonly found under Clay, or low black Land seven or eight Foot deep. Clay and Steel-marle sometimes under sandy Land. 'Tis rare in Clays that it lies above a Yard deep, tho' under Sand 'tis much deeper: But the *Suffex* Marle commonly shews it self at the bottom, or on the middle of the sides of hanging Grounds.

For the digging of Marle they commonly use Pick-axes, Spades, Shovels, and Wheel-barrows; and where the Pit is broad, that they can make an easie Ascent, small Carts which are about four Foot and ten Inches long, two Foot three Inches wide, and fourteen Inches deep, made so as a Load may easily be shot out of them. The Number of Carts must be proportionable to the Distance that the Marle is carried. They commonly have three, four, five, or six Hewers or Diggers to four Fillers, being proportioned so as to keep the Fillers always at work: Besides, to each Cart must be a Driver and a Setter, whose Office is to shew where 'tis to be laid, and to assist in the unlading of it: Some Sort of Marle requires a Carrier of Water to soften it for the Workmen's Shovels; and if there be Springs, as there often are in the Slate-marle, there must be help



help to lade or pump it out, which often occasions a great Increase of the Charge: For the easing of which I shall propose one of the cheapest and best Pumps that is for this Use; which is, to take four Deals or other Boards, which joint and nail well together; and if some Plates of Iron be nailed over the Edges of them, it will strengthen them much; these Pumps may be made single with a common Pump-handle to them, for one Man to



work them; or double for two Men, as in the Figure: *a a* shews the Cylinder of the Pump which is all of a size quite through; at the lower End at *B* is a Valve at the Bottom where the Water enters, and to retain it when in; at *C* is the Bucket fitted to the Cylinder of the Pump, with a Valve in the Bottom of it, which opens and shuts as the Bucket is moved up or down; so that the Bucket being let down to the Valve at *B*, it may raise the whole Column of Water in the Cylinder, and cause it to run out at *DD*; the pricked Line at *E*, shews how deep the Pump should stand in Water, which is to the Top of the highest Rise of the Bucket:

ket: These Boards may be of what length and breadth you please, according to the height you have occasion to raise the Water; only you must note, that the longer the Pump is, the less the Cylinder should be, because of the Weight of Water. One Man may work one of these Pumps that is twelve Foot long, and twelve Inches square, which will void a vast Quantity of Water in an Hour, with a great deal of ease; because the Motion is in Water without any sucking, which requires a much greater Strength than the Weight of the Water, which shews the Fault of the common Pumps in making of them of two different Bores, and of letting of the Bucket to work above the Water; the ill Contrivance of which I have experienced in several Pumps, and particularly in one of sixty Foot deep, which I caused to be bored quite thro', four Inches and half Bore; the Bucket I let down to the Bottom with Poles, which I grooved together and bound with small Iron-bands: The Poles I made almost the Bigness of the Bore of the Pump, to ease the VVeight of the VWater in the Cylinder, and it raised three times the VWater with half the Strength, when it was so altered, as it did before; and the Pumps so made are without those continual Repairs and Mendings, that the least Defects in Sucking-pumps are constantly requiring.

In *Lancashire* they use a Sort of Sledge that is made with thick VVheels to bring their Marle out with, which are drawn with one Horse, that being the best way, where you have not VWood, Gravel, or other things to mend your Carting-place with, because 'tis not so heavy as a Cart, nor will they poach so much: But then they require more Drivers: And therefore where you can mend your coming out, the first Sort of Cart is the best.

Marle

Marle is supposed to be fruitful from its Salt and oily Quality. The Salt they reckon it contracts from the Air; and therefore some think that the longer 'tis exposed to it, the better; for which reason they esteem it best to lay it on Grass-ground three or four Years before they break it up, and when they cover their Land with Marle, not to plow above an Inch into the Soil, that they may not bury it, it being apt to work downward. But Mr. *Markham* is of a contrary opinion, and is for having of it plowed in deep as soon as spread, because he says the Sun waists the Fatness of it. I think him to be in the right, as to the ordering of the *Sussex* Marle, and the other in the right about the *North* Country-marle; because, as I said before, I think the *Sussex* Marle much the fattest, and that the way of ordering of Marle must be according to the Nature of it; for the finding out of which, experience is the best Master; and 'tis for the same reason that they lay Marle upon hard binding Lands in *Sussex* the beginning of Winter, and on ground of a contrary Nature in *Staffordshire*, in *May* and *June*.

Some propose to know good Marle by putting of it in a Glass of Water, and if 'tis so tender that as soon as it comes to the bottom the Lumps break and dissolve, they esteem it good, else not; if it sparkle in the Water, and feel fat between the Fingers, 'tis reckoned a good sign; but the surest is its dissolving with Wet or Frost.

'Tis very necessary in marling of Land to find out the true Proportion that the Land requires, 'tis better to err by laying on too little than too much, because you may add more at pleasure. Marle doth not make so great an Improvement on Land the first Year, as afterwards.

*Quantity.*

In *Staffordshire* they lay two hundred Load upon an Acre, which they reckon the out-side of what is to be laid, except 'tis upon a black, loose, or a sandy Mould,



Mould, or a wormy Ground : On them they lay three or four hundred Load upon an Acre, and reckon they cannot be marled too much : Their common Observation is, That if 'tis a thin Mould, the Marle must be laid thin, and in a deep Mould thicker ; though there are some Lands that Marle only improves by making an Addition to the Depth of the Soil ; and they reckon, That if they marle an Acre of Land for twelve or fifteen Pound, that it will turn to good Account.

'Tis best sowing of Marled-land under Furrow ; because if they are well husbanded, they will be mellow and hollow, which will occasion the Lands sinking from the Roots of the Corn if it stand too high ; and the rougher these Lands are laid, the better, because the Lumps will dissolve with the Frost, and moulder to pieces, and by their breaking help to cover the Roots of the Corn.

If Marle sadden Land, or make it stiff or binding, you must dung it well, and lay it down for Grass.

Where Lands lie upon the sides of Hills, the Water issuing out of them, is apt to carry the Fat of the Marle away, except you can marle the upper Part, so as to have it wash down upon the lower ; and therefore flat Lands are best for Marle.

These Lands should not be plowed when too wet, because 'tis apt to make them poach and to breed Weeds, and 'tis good to plow them three or four Years, and then to lay them down three or four Years for Grass ; for great care must be taken not to plow them out of heart ; because after the Land is marled and laid down for Grass, if 'tis in heart it may be improved by Marle again, after it hath been some Years fed ; but if not, it will never be improved by Marle again ; and you must always observe, that when you design to lay down marled Land, to dung it well the last Crop ; because it opens the  
Land,

Land, and makes it much more fruitful, especially in natural Grass, or Grass-seeds; and by this means Marle will last good thirty Years upon many Sorts of Land.

In *Staffordshire* after their Lands are marled, their way is to take the Crops following, viz. After the first Crop of Wheat is off, they plow in the wheat Stubble in *December*; and if the Weather prove frosty to mellow it, they do not plow it again 'till *April*; when they sow it with Barly, allowing three Bushels of Seed to an Acre. Its common Produce is thirty Bushels. After Barly they sow Pease, for which they plow but once in *February* following, allowing three Bushels to an Acre; and next after Pease, (if they intend six Crops) they sow Wheat again upon the Pease-crop; the fifth Crop is Barly again; and for the sixth Years Crop red Oats: Some sow two or three Crops more when the Land is well marled, but 'tis better let alone.

Mr. *Markham* mentions four Sorts of Land in the Weald of *Kent* and *Sussex* improved by Marle. 1. A hazel Mould, which he advises to be plowed up as deep as it may be, even to the dead Earth, and to lay five hundred of the small Cart-loads of Marle upon an Acre: This Land they sow with Oats upon a Laye to kill the Grass; or they marle it in *May*, and sow it with Wheat, giving of it a Summer-fallowing first, and the next Year sow it with Pease, sowing of them early, and then with Wheat again, if 'tis a moist Summer; but if dry, they fallow it again first, allowing two Bushels of Wheat upon an Acre, which is the out-side of what he would have sown: Because if you sow it thick, it will be small, and the Straw slender, which the Wind will be apt to beat down. In *February* he would have the Wheat fed with Sheep, which will trample the Earth the closer to the Roots of the Corn: After which, if you roll it, he reckons it will be of advantage

vantage to it; and after the taking of two Crops of Wheat, his Advice is to lay it down for Grass five or six Years: And if it grow mossy or broomy, which these Lands are inclined to, then to break it up again, and to order it as you did before, laying of it down again from the Wheat-stubble: And thus being interchangeably sowed and rested, it will last good thirty Years: Whereas if the productive Fat of the Marle be spent by often sowing of it, and exposing of it to the Sun and Air, it will remain a dead Clod that is not capable of being mended with new Marle.

2. Marle Cope-ground, which is commonly a cold, stiff, wet Clay, and not so proper to be marled for Corn (except black Oats) unless in some places where 'tis very fleet for Pasture. Those Lands must be plowed fleet, lest the Marle be drowned with the Wet. Where you have good Drains, and that the Clay lies any thing dry, it may be sowed with Wheat. Three hundred Load of Marle upon an Acre of this Land he reckons sufficient, and that two Bushels and an half of Wheat will sow it, which must be sowed above Furrow fourteen or twenty Days before *Michaelmas*, and should be laid up in round high warm Ridges. These Lands must be well-mended with Dung and dry Earth; the Charge of which I cannot think will answer, especially if marled with *Sussex* Marle; and therefore I think their best Improvement is for Grass, which Marle will make very sweet for eight or ten Years, 'till the Marle is sunk so low, that another Crust of Earth is grown over it; and then it may be plowed up: But it must be done but fleet, and but a Crop or two of Corn taken from it, and then be laid down for Grass again. These Lands when fallowed, must be fallowed very dry.

3. Sandy and gravelly Grounds, which are to be ordered much as the Hazely, save only in that



more Marle may be laid on them, and that they must not be so often plowed. 'Tis best to plow these Lands pretty deep, that the more Marle may be laid on them. They commonly allow five or six hundred Loads to an Acre of these Lands, which they sow always under Furrow about *Michaelmas*, allowing two Bushels and a half of Wheat to an Acre, and leave it as cloddy as they can; and after they have taken a Crop from them, they fallow them, and sow them with Wheat again, for they do not reckon them rich enough as yet to bear good Pease. This done they let them rest four or five Years. If they run over with Broom, they cut or pull it up, and after that sow it with Oats; the next Year they fallow it, and lay three or four hundred Load of Marle upon it, and order it as the hazely Ground, and it will mend them for thirty Years. Where either the sandy or gravelly Lands are springy or wet, he advises rather to marle them for Grasse than Corn, and to lay five hundred Load of Marle upon an Acre. Some propose to burn Marle, and then to lay it on the Land; and that where they do so, sixty Load will go as far as three hundred Load not burnt; but they do not mention the Sort of Land 'tis to be laid on, nor of what Sort the Marle is. I have inserted these several ways of managing of marled Land, that so every one may make a particular Application of each way to Land of the same Nature; and that (if any do know of any different Sorts of Land, or different Sorts of Marle that are ordered after any other way) they will communicate their Observations about them.

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#### Chap. VI. *Of Fullers-earth.*

**F**ULLERS-earth is of a very fat Nature, and is very full of that vegetative Salt that helps the growth of  
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of Plants, which appears in its cleansing, scouring Quality; and tho' 'tis not much used for the Improvement of Land, because of the Profit it otherways yields, and because it may not so universally suit a great many Sorts of Land, as Marle doth; yet I cannot but think that it must be a very great Improver of some Sorts of Land; and of this mind I find Sir *Hugh Plat*, Mr. *Markham*, and others.

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**Chap. VII. Of Clay.**

**A**LL Sorts of Clays are a very great Improvement of gravelly and sandy Land, by allaying of their Heat, and making of them more solid and tenacious, and more constant in the Produce of their Crops, and prevents their being spoiled with every Uncertainty of the Season, altering and changing the very Nature thereof, as I told you before: For, as Mr. *Bernbard* affirms, even Marle it self is a kind of Clay that is become fatter, and of a more enriching Quality by a better Fermentation, and by its lying so deep in the Earth as not to spend or weaken its Fertility by any Product; which we find it will do when too much exposed: And therefore Clays that lie the deepest must be best for this use. However, Experience and Trial will satisfy everyone the best in these Sorts of Experiments, and the Cost of the Trial will be but small; and so there can be no great Hazard, if there is not a certain Gain.

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**Chap. VIII. Of Sand.**

**A**ND as Clays are an Improvement to Sand; so Sand by the same reason is an Advantage to cold Clays, in that it warms them, and unlocks their binding Quality. As for Sands found on the  
G 2 Earth,

Earth, the best is that which is washed out of High-ways, or from Hills or sandy Places, by the Violence of the Rains, or that which lies in Rivers: The common Sand that is dug out of the Earth having but little Fertility in it; only by Way of Contraction to Clay-grounds, they may effect much. This *Columella* confirms, and Mr. *Blith* adviseth for the increasing of Soil in Winter, where you cannot fold Sheep, to have a Sheep-house to feed them in, into which he would have you bring twice a Week several Loads of Sand out of the High-ways, Streets or Sand-pits; which by the Fatness of the Sheeps-dung and Urine, will make an excellent Manure for cold Clay-lands; the same will Sand make that is mingled with any Sort of Dung.

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### Chap. IX. *Of Earth.*

**A**S Marle, Clay, and Sand properly applied, make great Improvements; so do particular Sorts of Earths, as all Sorts of a saltish Nature, the black Moulds that lie in low Meadows, and Mud of Ponds and Rivers, especially if mixed with Dung, are a great Improvement of gravelly, and sandy Grounds, or any dry Up-lands, and so is Earth covered with Hovels, or Houses, especially such as have any Salt-petre in them: Or if they have been used for the folding of Sheep in, as is commonly practised in *Flanders*, according to the Way before mentioned of Sand; or if mixed with Lime, or any fat Substance, or the Dung of Beasts, Fowls, &c. especially if they are cast up to ferment together sometime, or be cast into low Places, that the Moisture of Dung washes into; which will not only improve the Earth, but moderate the Heat of the Dung, and make it a greater



ter Improvement of hot Grounds, especially for Pasture, and increase the Quantity of both Dung and Earth, which it concerns every Husband-man to do, as much as he can; because in the Quantity of his Manure consists the chief of his Profit.

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**Chap. X. Of Sea-Sand.**

**T**HE richest of all Sand is what comes from the Sea-Coast, and Creeks, of which they make very great Advantage in the *West* Country; the chief Virtue of which some reckon to consist in its Saltness, and others in the Fat and Filth that the Sea gathers from the Land-floods, the Shoars, the Fish, and things that putrifie in the Sea. I am apt to think that it proceeds from both, and that there is a third thing that contributes to its Virtue as much as any thing, and that is the Fish-shells that are commonly mixed with it, which the working of the Sea breaks as small as the Sand it self; for the fuller the Sand is of these broken Shells, they reckon it the better: Sea-shells of any Sort being very great Improvers of Land; especially such as is sowre or cold; but where they are not broke to pieces by the working of the Sea, 'tis good to break them with an Iron-stamper, or rather with such a Mill as they break Apples with; or else, which I think the better way, to calcine them, so as not to make Lime of them, but to give them such a heat as may cause them to moulder and fall to pieces with the Rain and Frost; because they are a long time else before they will dissolve, especially if they are of a hard strong Sort, such as Oyster-shells, &c.

The Sand used for Land is of three Colours: That about *Plymouth* and the Southern Coasts is of a blue or grey Colour, like Ashes, which some

reckon to proceed from the breaking of the Muscles and Oyster-shells mixed with it. Westward, near the Lands-End, the Sand is very white, and in *Scilly* glistering, which may be occasioned from the Mouldering of Moor-stones, or a Kind of Free-stone mingled with white scallop Shells. On the North-Sea from about *Padstow*, and Eastward to *Lundy*, the Sand is of a brown, reddish, yellowish Colour, and is composed mostly of broken Cockle-shells. In *Falmouth* near *St. Maw's Castle*, there is a Sort of Sand, or rather Coralline, that lies under the *Omse*, which they are forced to remove before they can come to the Bed of Sand. That Sand is reckoned the best that is of a red Colour, the blue next, and the white worst; the Sand taken up by dredges from under the salt Water, or that is left open by the Ebbing of the Tyde, and the Sand that is of the largest Grain, is the best; though the small grained Sand is esteemed the best for the Tenant, who only takes three or four Crops; and the large for the Landlord, and the Land, because it abides longer in the Ground, and makes the Pasture afterwards the better. If the Sand be well drained of salt Water, so as it may conveniently be carried, they reckon it better than if it lie too long in the Wind and Sun. Where the Sand is dredged out of the Sea, a Lighter-load that contains about twelve Tun, costs twelve or thirteen Shillings; where 'tis got from a dry Beech after an Ebb, it is not worth above four Shillings the Lighter. Where the Sand is near, they lay about sixteen Tun upon an Acre; where they can go three times a Day, they lay about ten Tun; where twice a Day, five Tun; and where but once, two or three Tun: And in some places but one Tun, where the distance is great.

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As soon as 'tis brought home they spread it on the Ground, from which they commonly take four Crops of Corn, and then lay the Land down for Pasture, for six or seven Years before they plow it up again; the Grass will be so good, that they commonly mow it the first Year; it runs most to white Honey-suckle or Clover; and though in some Lands the Grass is but short, yet it yields great plenty of Milk and Cream, fats Cattle exceedingly, and mends Garden-herbs and Fruits, making the Corn to have a large Ear, and a short Straw, so that sometimes the Ear of Barly is very near as long as the Stalk: But where little Sand is used there is much Straw, and not so much Grain. In well-sanded Lands little or no Snow lies, but there is a continual Spring even in the Midst of Winter, and the Harvest is commonly a Month or six Weeks sooner than in other places, and 'tis reckoned to agree with any Sort of Land whatsoever.

In *Cornwal* is a Weed called Ore-weed, which grows upon Rocks under the High-water Mark, and some is broken from the Bottom of the Sea by rough Weather, and cast upon the Shoar by the Winds and Floods, with which they improve their Barly-lands.

Snail-cod or Snag-gret lieth frequently in deep Rivers, and is full of little Shells; one Load of which is reckoned as good as three Load of Dung.

All Manner of Sea-Owse or Owse Mud, and the Mud of Rivers, Lakes, or the Bottom of Ditches, the Wash of Pastures, Fields, Commons, Roads, Streets, or Back-sides in any place where the Water meets with rest, or that Rain-water hath a long time settled, or that Sinks run into, are of very great Advantage to all Sorts of Land, especially dry Gravels or Sand, and are mixed with Dung.



In *New-foundland* they improve their Ground with the Garbish of Fish; and there is no doubt but that most things that belong either to the Sea, or Waters, may be of Advantage to the Husbandman, if judiciously used; because they are the Receptacle of the Fat that is washed from the Lands.

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### Chap. XI. *Of Dungs.*

**H**ORSE and Cow-dung are the most common Sort of Dungs, by reason of those Cattle being the most kept up; upon which Account their Soil is with the most Conveniency preserved. Horse-dung being of the hottest Nature is best for cold Lands, and Cow-dung for hot Land; or mixed together they make a very good Manure for any Sort of Land. In Winter-time, or when any Rains come, your Dung ought to be turned up on Heaps, and laid as thick as you can, to prevent the Sun's exhaling the Virtue of it, and the Rains washing away its Fatness, and the Nitrous Quality of it; and to beget the better Ferment in it, the best Time to carry Dung on upon Lands, is in Winter, that the Showers may wash it into the Ground; and because it will then be least exposed to the Sun. If the Land that you design to dung, lie in small Ridges, split your Ridges, by casting of two Ridges into the Furrow to fill it up, and so lay your Dung or other Manure on: Or which is better, plow three Furrows to one, that so you may lay your Manure upon the Top of the Land, and not bury it too deep. But where Dung is to be laid on a Summer's-fallow, 'tis best to be done just before you Twyfallow, observing not to spread your Heaps, 'till just you are ready to plow the Dung in; that so casting of it under Fur-

Furrow, you may turn the Ridge over it, so as to cover it from the Heat and Drought of the Summer-Sun and Wind, 'till you Tryfallow it; at which Time you may raise it again, and so turn the Dung up that was buried before. But many find fault with the dunging of Corn-land, and say, that it causes Weeds; and therefore in some places, to prevent that Inconveniency, they let their Dung lie 'till 'tis turned to Mould, by which means half the Virtue of the Dung is lost; for one Load of new Dung for Corn-land is worth two of old: Whereas the occasion of their Lands being subject to Weeds, is first from the natural Quality of it; and secondly from their laying too great a Quantity of Dung on them at once, many often laying forty or fifty Load upon an Acre; whereas the greatest Quantity that should be laid upon Clay-lands, if sown with Corn (which are the best Lands to bear Dung) ought not to be above twenty Load upon an Acre, and the red hazely Brick-earth, or light Sands, that are subject to Weeds, and that spend themselves in producing of Straw rather than Grain; ten or fifteen Load upon an Acre is enough at a time; because by that means you may be often dunging of them, and renewing of their Surface with fresh Dung: For in two or three Crops they will eat out the Virtue of any Quantity of Dung that is laid on them, and too much Dung doth but increase their Rankness: But the best Corn that you can dung these Lands for, is Barly, which delights in a well dunged Soil: But then it doth best upon an Etch Crop; because the fallowing of it the next Year will mix the Dung and Earth together, and will abate something of the strength of the Dung, and prepare the Land the best for Wheat of any way, as I have often experienced. Indeed upon gravelly or sandy Land thirty or forty Load may be laid

laid upon an Acre, or more, if 'tis a fleet Soil, and that 'tis mixed with a great Quantity of Earth, Marle, Mud or Clay, &c. For by that means you not only qualifie the Dung and mend the Land, but you increase the depth of the Soil, which is the best way of improving of these Sorts of Lands, or any Sort of Grass-grounds, as I said before : But clean Dung is best for Barly ; and if Dung be laid upon Land sometime before 'tis sowed, 'tis much better than to lay it on just at the Time of Sowing.

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### Chap. XII. *Of Sheep's-Dung.*

**T**His is the best of all Dung, especially for cold Clays ; which not being so conveniently gathered together, as other Dung, is commonly conveyed upon the Land by folding of the Sheep themselves upon it ; by which means both the Urine and Dung too is saved, which ought as soon as possible to be turned in with the Plough, that it may not be exposed to the Heat of the Sun : But the best Improvement of Sheep's-dung is to fold them in a covered Fold, and to mix their Dung with Earth, Sand, &c. as is before mentioned.

I have known vast Crops of Rye upon Barren Lands that have been old Warrens, and well dunged with Rabbits.

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### Chap. XIII. *Of Hog's-Dung.*

**N**Ext to that of Sheep, I prefer Hogs-dung, as one of the fattest and most beneficial of all Sorts of Dung, one Load of which will go as far as two Load of other Dung ; which might be an occasion



occasion of the Ancients mistake about its being a breeder of Weeds, because of their laying of it too thick, which (as I observed before) any Dung will do. 'Tis a very rich Dung both for Corn and Grass, especially the latter, and for any Sort of Land, but the best of all Dungs for Trees; and therefore many good Husband-men prefer it before most ordinary Sorts of Manure, and take great care not only to have their Hog's Coat well pailed, and paved with Pebbles, or other Stones, or where 'tis to be had with Chalk, which is much the best, and is thereby much advantaged for the Land; but also to increase the Quantity of the Dung as much as they can by casting into the Coat all the Straw, Beans, Roots, Plants, Weeds, &c. out of the Garden before they are full of Seeds, Fern and other Trumpery, which is not only very good for the Hogs, but some have increased the Dung so that out of a small Hog-coat sixty or eighty Load of Dung hath been raised in a Year. I think the best way of ordering of this Sort of Dung is to mix it with Horse-dung, for which reason I am for placing of my Hog-coat as near my Horse-dunghill as I can with Conveniency.

In *Staffordshire* on poor light shallow Land some sow a small white Pea which they never reap, but turn in so many Hogs to eat them as they think they will fat, and there they let them lie Day and Night, and their Dung will so enrich the Land, that it will bring a good Sward upon it, and graze well many Years afterward.

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#### Chap. XIV. *Of Urine.*

**U**Rine by *Glauber* is reckoned to be of a destructive mortifying Nature to Vegetables, because of the *Sal-armoniacal* Quality that is in it; but

but 'tis an indiscreet Use of it by the Application of too great a Quantity that makes it so, and even Dung it self will have the same effect for a Time where 'tis laid too thick. There is nothing that will improve Land, nor increase the Strength of Manure, nor help the Fermentation of Dung more than Urine will do: For which reason in *Holland*, they are as careful to preserve the Urine of their Beasts, as their Dung; and Mr. *Hartlib* in his Legacy commends it as a very great Improver of Land.

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### Chap. XV. *Humane Ordure.*

**H**Umane Ordure is of all Sorts of Dung the greatest Improver of Land, especially if mixed with other Dung, Straw, or Earth, to give it a Fermentation, and to render it convenient for Carriage, and sells in Foreign Parts at a much greater Rate than any other Sort of Manure.

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### Chap. XVI. *Of the Dung of Fowls.*

**I** Shall begin with Pigeons-dung, as being the most experienced, forty Bushels of which will manure an Acre of Land, and therefore is very convenient where Land lieth at a distance, and where other Manure cannot conveniently be carried. 'Tis best for Barly or Wheat, and on cold Lands, it being a very hot Dung: The common way of ordering of it is to sow it by hand after the Grain is sowed, and in the same manner as they sow Corn; and so to harrow it in with the Seed: For one Crop, this often makes a very good increase.

*Hens-*

*Hens-dung* is a very rich Dung, but because of its hanging together 'tis not so easie to sow as *Pigeons-dung*, so that you cannot well tell how to give the Land a due proportion, but either it will be too thick or too thin; and therefore 'tis best mixing of it with other Dung, or with the *Ash-heap*, or with Earth or Sand.

*Goose-dung* by the Ancients has been esteemed very hurtful and prejudicial both to Corn and Grass, and is so esteemed by many now, and very unhealthful for Cattle. Indeed in long Grass that is ready to mow, or in Corn, they will do mischief by treading of it down with their Feet, and eating of it; but for their Dung, it's as good both for Corn and Grass as the Dung of any Fowl whatsoever, as hath been experienced by many. 'Tis much of the same Nature with *Hens-dung*; and as for the wholsomness of it, at *Sutton* in *Nottinghamshire* is a Field that was given to the Town for a *Goose-pasture*, whose Dung hath made it (I think) one of the richest Pieces of Pasture that I have seen, and as it lies open in a common Field, I have often observed, that all Sorts of Cattle covet much to feed on it; nor could I find by any of the Inhabitants that Cattle feeding on it receive any prejudice from it. I have likewise a small Pasture by my House on which my Geese lie very much, that I keep a Horse in, who, I find, eats the Grass barest where they have dunged most; nor could I find that ever it did him any injury, except it made him too fat. Besides, their Dung is used in several Medicines both for Cows and Horses.



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Chap. XVII. Of several other Soils and Manures.

**A**shes of all Sorts contain in them a very rich fertil Salt, and are the best Manure of any to lay upon cold or wet Lands, especially if kept dry, that the Rain doth not wash away their Salt. One Load of dry Ashes will go as far as two Load not kept so. But as Rain-water diminishes their Salt, so the moistning of them with Chamberly or Soap-suds will add mightily to their strength, as I have often experienced. Two Load of these Ashes will manure an Acre of Land better than six Load of those that are exposed to the Rain, and that are not ordered so, which is the common Allowance for an Acre, though some Lands do require more, and some less. That the Ashes of any Sort of Vegetables are very advantageous to Land, is what is experienced in most places of *England*, by the Improvement that is made by burning of Fern, Stubble, Straw, Heath, Furz, Sedge, Beanstalks, &c. but of all Sorts of Ashes I esteem Sea-coal-ashes the best for cold Lands, and the most lasting: If you sow your Ashes upon Grass-ground do it in *April*, but upon Corn just after you have sowed your Seed.

*Soap-ashes* Sir *Hugh Plat* commends very much after the Soap-boylers have done with them, both for Corn and Grass: They are good for cold or sowre Lands. I am told of one by *Ware* that had a piece of Land that was run over with Broom and Furz, which he manured with Soap-ashes, and sowed it six Years together with Wheat, and had incredible Crops: But I could not learn what the Nature of the Land was, nor the Quantity that he

he laid on ; some say it kills all Sorts of Weeds and Trumpery whatsoever.

The Ashes, after the Pot-ash Men have done with them, are good for most Sorts of Land, only as they have been wet, and so the Lee hath drawn out most of the Salt, it will be necessary to lay them much thicker than other Ashes.

Soot also is very good both for Corn and Grass, especially what grows on cold Clays or Lands much run-over with Moss ; but Sea-coal Soot is the best by much : They commonly allow forty Bushels to an Acre, but some Lands will require more : It produces a mighty fine sweet Grass, and destroys Weeds and Trumpery. Wooll-nippings and tarred hempen Ropes cut small, and untwisted, are beneficial for Land.

Raggs are a very great Improvement of chalky binding Lands. Many Loads of them are fetched from *London* to *Dunstable*, which is thirty Miles, only to lay on their Lands, they cost about Fourpence *per* Bushel at *London*. They chop them very small and sow them just after the sowing of the Corn, allowing four Sacks to an Acre, each Sack containing six Bushels.

All Sorts of Hair of Beasts, being thinly spread or sown, and suffered to putrifie, make a very great Increase on Corn-lands, and all Shavings of Horns, Hoofs of Cattle, Blood, Garbidge, &c. is good Manure for Land.

*Malt-dust* is an enricher of barren Land, and a great Improver of Barly, which they sow by hand as they do the Seed, and after the sowing of it, allowing forty Bushels to an Acre, but it lasts but one Crop.

Some

Some commend Dyer's-dung as a Manure very good for all Sorts of Land, two Load being sufficient for an Acre.

All Sorts of Fern, Straw, Stubble, Rushes, Leaves of Trees, or any manner of Vegetable whatsoever, cast into the Dung-yard, before they are near feeding (else they are apt to breed Weeds in the Dung) are of great advantage to increase the Bulk of the Dung.

Barks of Trees have a very rich Salt in them, especially that of Oak, and so hath rotten Sawdust or any other rotten Wood, which mixed with Earth makes Land light, enriches it very much, and even alters and changes the very Nature of it, turning of it into a rich black Mould.

In the Coal-mines they usually dig a kind of blue or black Clay, that lies near the Coal commonly called *Urry*, and is as it were an unripe Coal, which is very proper for hot Lands, especially for Pasture-grounds.

In *Cheshire* they improve their Lands by letting out the Water of the Salt-springs on them, which they do always after Rain; and there is no doubt but that a moderate Quantity of Salt sown upon Lands, especially those that are troubled with Worms, would be a very great Improvement of them: There being no Lands richer, and that fat Cattle sooner than those Lands that are but sometimes over-flowed with the Salt-water; as only at some extraordinary Spring-tydes, as may be seen in some salt Marshes near *Erith*, and in some Parts of the Hundreds of *Essex*, especially where they have any fresh Water to go to in some near adjoining Lands: And therefore I cannot but think that Lands near the Sea might be much improved by watering of them with Salt-water; however in Time of Peace Bay-salt would be but a small Charge, considering how small a Quantity would manure an Acre.

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In *Cumberland* a small Parcel of Land of two Acres and a half is let for Eleven Pound *per Annum*. What improves it to that Value is the emptying of the Town-Tann-pits on it.

Any soft Stone, as Fire-stone, Lime-stone, &c. if broke small, and laid on cold Lands must be of Advantage to them, as is practised at *Hornetton* in *Oxfordshire*, where they dung their Lands, with the Chippings of a Sort of soft Stone that they have there. In fine, whatsoever is apt to rot and consume in any competent Time, and that is either salt, unctuous, or fatty, is good for the Improvement of Land.

All these Dungs and Soils before-mentioned are improved by the mixing of them together, and by the giving of them a good Fermentation: The common way of doing of which, is by laying of the Dung on heaps 'till it rots; but the way that would be most profitable to the Husband-man, is to make near his House or Barns a large Pit in length and breadth according to the Quantity of the Soil he hath, and to pave it with Stone or Chalk, that it may detain the Moisture of the Dung; because the moister the Dung lies, the sooner it will ferment and rot; but if you can have a covering over it so as to keep all the Rain-water out of it; or if you can moisten it with the Urine of your Stables, Sink of your House, &c. it will much improve it: For the Rain-water that runs from it, carries away the Salt of the Dung with it, which is the chief Cause of its Fertility. But if you cannot have such a Conveniency, lay it as thick on heaps as you can, and in the moistest lowest Places that you have, covering the Top of it with Turf, or other Earth, to prevent the Sun and Wind from exhaling and drying up the Virtue of it: For the well preparing of your Dung, and the Increase of its Quantity, is a Piece of Husbandry,

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bandry, that great Care ought to be taken of; for the better and greater the Quantity of your Dung is, the better will be your Crop; and the Increase of your Crop will make an Increase of your Dung: And so on the contrary, a Decay in your Dung makes a Decay in your Crop, &c. and therefore the Whole of your Profit, and the Value of your Farm depends upon these two Points.

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## B O O K V.

*Of several Sorts of Corn, Grain, &c. and the Way and Manner of Ordering of them.*

### Chap. I. Of Rye.

**R**YE doth well upon any dry Sort of Land whatsoever, though the barrenest Sand or Gravel. They sow it about the Beginning of *September*, after a Summers-fallow, in the driest Time they can, according to the Old-saying of Sowing, *Rye in the Dust, and Wheat in the Dirt*; They commonly allow two Bushels of Seed to an Acre; but if 'tis new-broke-up Ground, or Land subject to Worms, they allow about a Peck more.

A little sprinkling of Dung or Mud upon Rye-Land, will mightily advance a Crop, though it is laid but half the thickness it is for other Corn. Its Produce is commonly about twenty Bushels upon an Acre.

It is ripe when the Straw is turned Yellow, and hangs the Ear, and that the Grain is hard: 'Tis not very apt to shed; and therefore if it is weedy you must let it lie upon the Ground or Gravel, as they call it, after it is cut, eight or ten Days before you bind it, if the Weeds are not dry sooner,  
or

or else they will give in the Barn, and cause it not to thrash well, and make it musty. But as it is a Grain that will grow in the Ear the soonest of any if wet, so you must take care, if Rain comes, to turn it once in two or three Days at most, and to lay the Ears upon the Stubble as high above the Ground as you can, and it will prevent it: But if it is without Weeds, you may house it as you cut it. If Rye or Wheat be lodged, cut it though it be not thorough ripe; for if the Straw is broke, it will yield no more Nourishment to the Grain.

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## Chap. II. *Of Wheat.*

**T**Here are several Sorts of Wheat, as whole Straw-wheat, red Straw-wheat, Rivet-wheat, white and red Pollard-wheat, Turkey-wheat, Gray-wheat, Lammas-wheat, &c. some of which thrive better, and are more agreeable to some Sorts of Land than others, though generally all Wheat doth best upon stiff Clays, especially if well drained that it lie dry: But as some Sorts of Wheat thrive better on some Sorts of Lands than others; it would do well if more particular Observations about each Sort were made, than is. The white Egg-shell-wheat is reckoned best for light Lands, and to sow with Rye for Messin; because 'tis earliest ripe of any, and should be forwardest sown. 'Tis much sown in *Essex* upon their hazely Brick-Earths or Loams, as the Red-wheat and the Polerivet or Bearded-wheat is there, and in *Hertfordshire* upon stiff yellow Clays. In *Oxfordshire* they have a Sort of Wheat that they call long Cone-wheat, which they reckon best for rank Clays, and its Straw not being hollow makes it not subject to lodge or to be mill-dewed, and is not so liable to be eaten by the Birds, only the Flour of it is



somewhat Coarse. Their white, red-eared Wheat hath a white Ear and a red Grain, and is a very good Sort of Wheat for Clays; it bears a very good Crop, and seldom smuts. In *Staffordshire* they reckon the red *Lammas* or Bearded Wheat the best for cold Lands or stiff Clays. In *Barkshire* is a Wheat called pendulum Wheat, from its hanging of its Ear much like the Cone-wheat.

Wheat is commonly sown after a Summers Fallow, though in *Barkshire* they often sow it upon a Lay, harrowing of it in as they do Oats, and say that it prevents its being full of Weeds; sometimes in *Hertfordshire* they sow it upon an Etch Crop after Barly, plowing of the Barly-stubble in as soon as the Corn is off the Land. But this is seldom done, and only on Land that is very rich. 'Tis best sowing of it about the Beginning of *September* if you have any Rain; if not, 'tis best staying 'till you have: For it will not come up 'till wet comes, let it be never so long first, except the Land is very moist just before sowing. I have known Wheat mustied and spoiled so as never to come up at all, that hath lain long in the Ground before Rain came: And if your Land be any thing dry, it will do well enough if sown in *November*. All the Hazard of late sowing is a wet Winter. They commonly sow two Bushels of Wheat upon an Acre: But if new-broke-up Ground, two Bushels and a Peck. If the Soil be deep, sow it under Furrow: But if 'tis fleet, with a broad Cast, which some do with a single Cast, and some with a double Bout, that is to sow it twice in a place, harrowing once between, after which they harrow it so many times in a place as is necessary to cover the Seed well.

If your Wheat or Rye be rank, it will do well to feed it with Sheep in *January* or *February*, only you must observe not to feed Rye after the first, nor Wheat after the Middle of *March*. If

If *May* prove dry, the Corn will get above the Weeds; if not, weed it about the latter End of *May* at farthest: The Thistles cut with a Hook, but the Docks, Tyne, Tares, May-weed, &c. pull up by hand.

Wheat is ripe when the Straw is turned yellow, that it hangs its Ear, and that no Greenness appears in the Middle of it, and if when you bite the Grain, you find it hard. Its common Produce is twenty or thirty Bushels upon an Acre.

If Wheat is weedy it must lie upon the Gravel, and be ordered as they order the Rye. But in *Oxfordshire*, and several other Countries, they bind up their Wheat in Sheaves, tho' 'tis full of Weeds, and set three Sheaves against three Sheaves, and cover the Top by opening of two Sheaves, with which they cover the six under-ones, hanging of the Ears downward, and so they let their Wheat stand three Weeks or a Month in the Field, before they carry it in, for no wet can hurt it; nor is Corn so set subject to grow.

### Chap. III. *Of Barly.*

THE *Barly* sown in most places is commonly of one Sort; but in some places they sow *Sprat* or *Fullum Barly* which is the best for rank Land, because it doth not run so much to Straw, as the common Sort, and yields much better.

In *Oxfordshire* is a Sort that they call *Rath-ripe Barly*, which hath some years been sown, and returned into the Barn in two Months time; some call it *Patney Barly*, because they commonly have it from *Patney* in *Wiltshire*. It may be sown the latter End of *May*, and yet be ripe early enough.

In *Lincolnshire* they sow a Sort of *Barly* that they call *Scotch Barly*. It hath a square Ear: 'Tis

but a lank Grain, but 'tis a hardier Sort than the other Sorts of Barly are, and will grow upon a meaner Soil, and is earlier ripe.

In *Staffordshire* is *Tritico-Speltum*, or a Sort of naked Barly, or Wheat-barly, that is shaped like Barly, but the Grain is like Wheat; 'tis much sown at *Rowley*, *Hamstal*, and *Redmore*, where they call it *French Barly*: It makes good Bread, and good Malt, and yields a good Increase; and therefore would do well to be tried in other places.

Barly is sown either after a Fallow, or on an Etch, or second Crop. If after a Fallow, the Land must be three times plowed in Summer, as for Wheat, only the third time it must be laid up in small Ridges to lie all Winter: In *March* they split the Ridges and harrow them well over, making of the Land as fine as they can, and then they plow it up to sow.

Some at the time of Twy-fallowing in *June* *Turneps*. make the Land very fine, and sow it with *Turneps* which they feed with Sheep in Winter, and then plow it up in *March*, ordering of it as before; or you may plow it up but once just before you sow your Barly.

If you sow your Barly upon an Etch after Wheat, as soon as the Time of sowing of Wheat is over, which is commonly about the Beginning of *October*, plow up your Wheat-stubble in as dry a Time as you can, and lay three Ridges to one, if you have Dung to lay on it; if not, plow it in small Ridges as before is directed, because the Land will lie the dryer, and the Frost will mellow it the better: Then plow it up again in *March*, and order it as before. If 'tis sown after Oats, you may only plow it once in *March*; but if you plow it in *October* too 'tis the better: Or if you have an early Harvest and dry Weather, and that your Time will allow of it, it will be a greater Improve-



provement of your Land, if you plow it up before you sow your Wheat just as Harvest is in; this will make it half as good as a Summers-fallow. But all Years will not allow the doing of it this way.

One in *Essex* that lives near a large Market-Town where he hath good Quantities of Dung, sows his Land with Barly and Clover; he reaps his Corn at Harvest, and feeds his Clover all Winter; in Spring he mows or feeds it 'till the Middle of *July*, and then fallowing of it, in Spring he sows it again with Barly and Clover, which he repeats every Year, and hath very great Crops; his Land is a light rich Mould, somewhat inclining to a gravelly Bottom.

Some sow Barly in small Ridges like Wheat, and some on broad Lands, which the rounder they are laid the better: But all Sorts of Ridges they rowl with a Roller at the coming of the first Shower of Rain that comes after the Barly is sown, for to break what Clods were unbroken before, to settle the Earth to the Roots of the Corn, and to make it even to mow.

The Time of sowing of Barly is in *March*, *April*, or *May*. If the Land is subject to Weeds, 'tis best sowing late; but 'tis commonly best to take the first dry Season that you have, dry Weather being best for most Summer Corn. But if you do sow late, soak your Barly twenty four Hours in Water, in which Sheeps-dung hath been infused, and it will come up presently; this way you may sow Barly about the Middle of *May*, and it will do well, if want of good Weather, or Business, oblige you to stay so long. 'Tis best to sow light Lands first, the best Lands to sow late, being the Clays.

'Tis sown with a broad Cast at two Bouts or Sowings, the first sowing being harrowed in once, and the second sowing as many times as is needful

to cover it well, and to make the Earth fine, which commonly requires six or seven Harrowings. The common Allowance of Seed is four Bushels to an Acre, though they say that three Bushels of Sprat Barly will do.

It delights in a light dry Ground, such as is the black rich Mould, and in most Sorts of Clays that lie dry, if made rich with Dung, Ashes, Chalk, or Lime; on some Lands Pigeons-dung, Malt-dust or Soot do well first. Sir *Hugh Plat* commends Soap-ashes as an extraordinary Improver of Barly, even upon barren Lands.

*Barly* is ripe, when the red Roan, as they call it, is off (that is a reddish kind of Colour that is on the Ear) when it hangs its Ear, and that the Straw hath lost its Verdure. If it is full of Weeds it must lie on the Swath 'till the Weeds are dead: 'Tis not apt to shed, but in wet Weather it will be inclined to sprout or must; and therefore every fair Day after Rain it should be shook up and turned; and as soon as it is any thing dry, be made up into Cocks. Its common Produce is two or three Quarters upon an Acre.

#### Chap. IV. *Of Black Oats.*

**B**lack Oats are commonly sown upon an Etch-Crop, or on a Lay; which they plow up in *January*, when the Earth is moist, taking care to turn the Turf well, and to lay it even and flat.

Oats are sown with a broad Cast at twice, as they do Barly, harrowing of it well in: Only you must observe to harrow the same way the Furrows lie of a Lay, or but very little cross, for fear of raising the Turf; but upon an Etch as soon as the Land is plowed on edge, they sow it, and then harrow it once, and sow it again a second Time  
the

the full Quantity, and then harrow it five or six Times over, observing to harrow once or twice cross; which breaks the Clods and covers the Seed better than harrowing all one way. They commonly sow them on a broad Ridge, which they give the Land but one plowing for.

The usual Time of sowing of black Oats is the latter End of *February*, or the Beginning of *March*, they being a hardy Grain that will bear any thing of wet or cold: Four Bushels of Seed being the usual Allowance for an Acre. They will grow on any Land, but delight more in a moist cold Land than in a dry.

Oats are ripe when the Straw turns yellow and the Kernel hard, when the Chaff begins to open and to shew the Seed.

When they are cut, let them lie for the Dew and Rain to plump them, and to make them thrash well; and if weedy, to kill the Weeds; but if Rain wet them much, you must get them in as soon as they are any thing dry again, or they will shed; for Oats may be inned the wettest of any Corn without much prejudice to them, especially if the Weeds are but dead: But white Oats are apt to shed most as they lie, and black as they stand.

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#### Chap. V. *Of White Oats.*

**W**HITE Oats are commonly sown upon an Etch after Wheat, Rye, or Barly; they only give the Land one plowing, and sow them and harrow them as they do black Oats, except the Land is subject to Weeds; then 'tis good to plow the Wheat or Rye-stubble up in *November*, which will make it rot the better, and be a kind of Winter-fallowing: Only if you have a very dry burning Ground which black Oats will not delight in, in that case they often sow them upon a Lay.  
The



The usual Time of sowing of white Oats is in *April*; the dryer the Time is that you sow them in, the better. They love a dry Land, and will do well on Gravel and Sand, and are the best Corn to sow on Grounds subject to Quitch-grass or other Weeds, because they may be plowed later. They come up sooner, and top the Weeds better than black.

As to the mowing and ordering of white Oats at Harvest, 'tis the same with that of the black; the common Produce of both black and white Oats is about twenty Bushels upon an Acre.

In *Staffordshire*, and almost all the Northern parts is a Sort of red or naked Oats that is extraordinary good for Oat-meal, because the Kernel thrashes out of the Hull without carrying of it to the Mill, or drying of it: They order these Oats as they do Barly.

## Chap. VI. *Of Buck-Wheat.*

**B***uck-Wheat* or Brank, is a Grain very useful and advantageous in dry barren Lands. 'Tis commonly sown about the Beginning of *May*: One Bushel will sow an Acre. After 'tis mown it must lie several days 'till the Stalk (which is somewhat hard) be withered before it is housed. 'Tis in no danger of the Seeds falling, nor doth it suffer much by Wet; but 'tis ripe pretty late. It yields a good increase upon Land any thing good, often fifty or sixty Bushels upon an Acre, and is excellent Food for Hogs, Poultry, &c. The Flour of it is very white, and makes a very good Sort of Pancake mixed with a little Wheat-flour.

Buck-Wheat makes a very good Lay for Wheat or Rye, especially if not mow'd, but plow'd in; but the best way is when 'tis in Grass, just before it

it blossoms, to feed it with Cattle, especially milch Cows, which it will cause to give a great deal of Milk, and make both the Butter and the Cheese very good, and yield Food for your Cattle in the driest Time of Summer, when all other Grass is burnt up, and prove a very great Improvement of your Land.

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### Chap. VII. *Of Pease.*

**P***ease* are of several Sorts, as, white, green, grey, &c. most of which require different Sorts of Land and Management; and therefore if more particular Observations could be made of them, it would be of advantage to Husbandry, all codded Grains being a Destroyer of Weeds, an Improver of Land, and a Preparer of it for other Crops. But Pease and Beans are what belong to Garden-Tillage, as well as that of the Field; and as I design not to meddle with any thing of Gardening at present, so I shall confine my self only to what relates to the Management of them in the Field.

The common Sort of white Pea doth best in a light Land that is somewhat rich: If the Land is any thing binding, they do best sown with a broad Cast, and only harrow'd in: The best Time for sowing of them, is about the middle or latter End of *April*; they commonly allow three Bushels to an Acre.

Pease are commonly reaped with a Hook at the End of a long Stick: They let them lie in small Heaps as they are reaped, 'till they find the Hawm and the Codd dry. They ought to be turned and raised from the Earth as much as you can, that they may lie hollow for the Wind to dry them, especially when any Rain comes to wet, and beat them down.

In

In *Staffordshire* they sow Garden-Rouncivals in the Fields, and find them to kernel well, and to yield a good Increase, though they run upon the Ground unsupported with Sticks.

Gray-pease are commonly sown under Furrow, and delight most in a cold moist Clay: The common Allowance for seed is two Bushels to an Acre, and the usual Time of sowing them is in *February*: In some places they sow them sooner, they being a hardy Grain. They are reaped, and ordered much as the White-pea.

In *Oxfordshire* they reckon the *Henley* gray and the Red-shank Pease are the best for new-broke-up Ground, the *Vale*-gray for strong Land, the *Hampshire* Kids for new chalked Lands, the small *Rathripe* Pea for poor gravelly Ground, and the *Cats-wold* Pea for sowre Land.

### Chap. VIII. *Of Beans.*

**B***Eans* are of several Sorts, but 'tis only the small Horse bean that is commonly propagated by the Plough. They delight chiefly in a stiff strong Clay, and thrive not in light or dry Grounds. They are commonly sown in *February*, or sooner. Three Bushels will sow an Acre. They commonly reap them with a Hook, like Pease, and let them lie out a great while to dry. In the North they bind them up in small Bundles, and make small Ricks of them in the Field, where they let them stand a long time. The common Produce of them is about twenty Bushels on an Acre.

*Vetches.* The *Chich* or *Vetch* are of several Sorts, but the most known are the Winter and the Summer *Vetch*; the one sowed before Winter, which abides the Extremity of it, and the other in Spring. They are



are a good, strong and nourishing Food for Cattle, either given in Straw or without, and are propagated after the Manner of Pease.

The least of all Pulses is the *Lentil*, in some *Lentils*. places called *Tills*: They require but an ordinary Ground; and though but very few of them are sown upon an Acre, yet they produce an incredible Quantity, though they seem but of small Bulk, and lie in a little room in the Cart. They are a very good sweet Fodder, and to be preferr'd before any for Calves, or any other young Cattle, and are the cheapest Food for Pigeons.

*Tares* are of as great advantage to Land, as other *Tares*. Pulses are, but are rather to be preferred to feed Cattle with than any other thing, only the Seed is good for Pigeons. They are commonly sown in *February*, and require a dry Ground. They need but one plowing, and want no other Manure but the plowing in of the last Stubble, because they enrich the Land themselves. You must be careful not to sow more than you can cover the same day, because the Dew is apt to spoil them.

Some sow Horse-beans and *Tares* together, which is a very good way of ordering them. They are easily parted with a Riddle.

There are several other Pulses or Seeds mentioned in many Authors, that are not yet brought into common Use, which, if more particular Observations were made of them, might in many places be more useful than they are. But of them I shall treat farther, when I have procured a more particular Account.

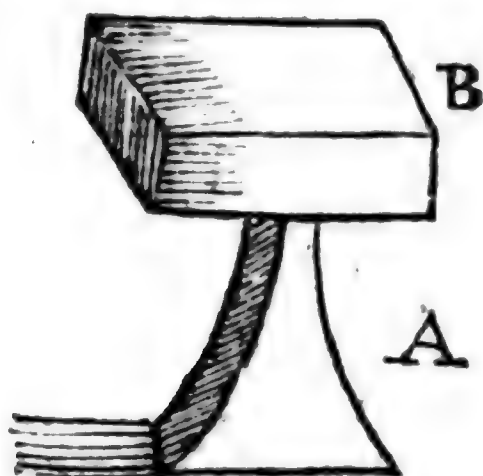
## Chap. IX. *Of Preserving of Corn.*

THE Preserving of Corn when it is cheap and good, is not only a very great Advantage to the

the Husbandman, but likewise to the Poor; for in scarce and dear Times the Husbandman hath little to sell to advance his Stock, and the Buyers are usually furnished with musty bad Corn from Foreign Parts ( who often buy our Corn when cheap, and sell it to us again when dear ) or from such as were ignorant of the ways of preserving it. Therefore in cheap Times it will be necessary to make use of some of these following ways for the storing up of Corn against a Scarcity, which he may be sure of buying in cheap in dry Years, and be certain of selling dear in wet ones.

The common ways of keeping Corn are in the Straw unthrashed, or in the Granaries when 'tis thrashed. As for the keeping of it in the Straw, the common way is to make it up into Stacks, by which way they often have very great loss by the dampness of the Ground, which commonly rots and spoils it, sometimes near a Yard thick; and by Rats and Mice, and other Vermin that breed in the Stack, which eat and devour a great part thereof. To prevent both which Inconveniences, where Timber is plentiful they set four, or six, or more Posts into the Ground, according to the Bigness that they design the Stack, Granary or Barn that the Corn is to be laid in: On these Posts they lay what is the Ground-plats of other Building, upon which they make a Floor, or lay Pieces cross to support the Stack: And if they make a Barn or Granary of it, they erect Sides and a Roof upon it; but if only a Stack, they cover it with Thatch, and the Posts that support it some do round with Tin near the Top, for about a Foot or so in breadth, to prevent the Mice and Rats getting up. But as Tin is apt to rust, and so to lose its smoothness, it will not keep them down long; and therefore a better way to prevent their getting up, is to do them with *Dutch Tyle*, such as they set Chimneys with,

with, which will always keep smooth. But in *Hampshire*, and other Countries where they have plenty of Stone, they make their Supporters of two Stones, after this Form, which is the best way.



The lower Stone at *A* is about three Foot high, two Foot wide at the Bottom, and one at the Top. Over this they lay another Stone, as at *B*, of about a Yard square: Some make it of a round Form, which is the best. This prevents not only the Mice and Rats from climbing up, but also the Dampness of the Ground: And this way you may keep Corn as long as you will, without much Inconvenience or Loss, except what it loseth in the first Years shrinking, and loss of Weight: Only you must observe, that what Corn you stack, must be bound up in Sheaves, that so the Ears of the Corn may be turned inward, and the Straw-ends out, which will save the Corn from Pigeons, Crows, and other Fowls, and likewise from the Rain that beats on the sides. If your Stack be of Wheat, you may lay Oats or other coarse Grain on the Top of it, under the Thatch, the greatest danger of Wet being from the Top if any of the Thatch should blow off. And if you suspect any Rats or Mice got into the Stack, grease a Stick and thrust it into it; and if there be any, they will gnaw the Stick. The chief Inconvenience that attends this way



way of keeping of Corn, is its Bulkiness, and the Farmer's wanting of his Straw to make Dung with, and the Chaff to give his Cattle, &c. Which several Occasions may compel him to thrash out his Corn: And therefore I shall consider the ways of keeping it, after 'tis thrash'd and dress'd, in Granaries, which are made divers ways, according to the **Nature** of the Country, and the Materials it affords, and the Custom of the People.

Some Granaries are made with Clay mixed with Hair, chopp'd Straw, Mulch, and such like: But these are the worst, because they harbour Vermin, and soonest corrupt Corn: For although they are warm, which is a great Preservation of Corn, yet they yield Dust, and from that Dust are bred Fleas, Mites, Weevils, &c. which spoil Corn, and make it easily rot.

Others are made of Stone and Lime; but they are subject, against wet Weather, to give and be moist, which is very bad for Corn, and will must it; and so will those made of Brick; and therefore some propose as the best, either those Buildings that are made with Stone only, and Plaister laid on the inside an Inch and a half thick, that so no Stone may come near the Corn; or else to be made of Brick mix'd with Timber, to which Boards may be fastned to line the Walls with, and the Floors to be of Plaister, which is cool in Summer and hot in Winter, and is a great help in the keeping of Corn; and that the Windows of your Granaries be to the East or North-East, because it keepeth the Corn always dry, fresh, and cool: And if likewise you have Holes to let the Air blow through, it will do well.

The Granary in the City of *Shenibank* in the Vale of *Parinburg*, upon the River *Elbe*, which is a Storehouse for the Wheat of which the Mum is made at *Brunswick*, is made after this manner. The Granary is three hundred Foot long, eighteen Foot wide

wide within, seven Stories high, each Story seven Foot, all built of Brick, with large Windows round to open and shut close, which as the Wind blows, are opened, and then the Men turn the Corn, so as the Dust may fly out: And when the Weather is fair, they open the Windows to let in the Air. At each end, and in the middle, are Stoves to keep fire in, in moist Weather, and at the going away of great Frosts and Snows, to prevent Moisture. There are also in each side of the Granaries three long Troughs or Spouts in the upper Lofts, and in fair Weather the Men throw the Corn out of the upper Loft, and so it falls into another Spout made about ten Foot wide at the top, and eight or ten Inches at the bottom, through which the Corn falls into the lower Rooms, and then is wound up by a Crane fixed in the upper Loft; and so the Corn falling down from one Story to another, is cleansed by the Wind from all Dust and Chaff, and receives the Benefit of the Air, &c. These Troughs and Spouts are to be put on and taken off as occasion requires, to any of the Windows, that when any Vessels come to lade Corn, they may by these Spouts convey the Corn into the Barges, without carrying it on Men's backs, &c. The Wall of the first Stories is two Bricks and an half thick, two Bricks the three next Stories, and a Brick and an half to the top. There may be kept in it fourteen thousand Quarters of Corn, which is two thousand Quarters in each Loft, or one thousand Bushels in each Bay, there being sixteen Bays, each eighteen Foot long, about seventeen wide, or three hundred square Feet in each Bay, &c.

If with the Troughs there were Holes in the Floor to let the Corn, like Sand in an Hour-glass, run from one Floor to another, I believe it would save much Labour, and be of much more Advantage to the Corn.

In the hot Countries, in dry sandy Ground they make great Caves or Pits to keep their Corn in ; the insides of which they make very smooth, and put some of the Chaff in first, and then their thrashed Wheat, filling of it up within a little of the top, upon which they lay Chaff again, 'till 'tis quite full, and close the top with a broad Stone, covering of it up close with Earth ; by which way they keep it good many Years.

Some cut off the Ears, and put them up close into a tight Cask, which will keep it very well, and is the only way of carrying any Sort of Corn over the Sea, that you desire to sow in a Foreign Country.

The best way of keeping Corn in *England* is to build a Barn of Brick or Stone, plaistered a good thickness within, about four Foot high above the Ground ; upon which put a pretty broad Board sloping, to prevent the Mice and Rats from going up : Upon which erect a Barn, and let the Door and Loop-holes, to put the Corn in at, be above the shelving Board, so as to go in and out of it with a Ladder, which you must be careful always to take down, and not leave standing up when you come out, lest the Mice get up it into the Barn. I know this to be an effectual way of keeping Vermin out ; because a Gentleman in *Hertfordshire* built one of this Fashion, and no Mice or Rats did get into it. By this means there is no loss of Room at the bottom, as there is in a Building set upon Supporters. This Sort of Barn, as high as the Brick or Stone-work comes, must be lined with Boards, and the Floor raised at the least a Foot above the Earth that is on the outside of the Barn, to prevent any Damage being done to the Corn by the Moisture of the Earth, or Walls. This Floor I would have covered with Plaister made of Stone-lime, where 'tis to be had : Where not, let it be boarded



boarded throughout. In this Barn you may lay up your Corn in the Straw ; and if you have occasion to thrash out your Corn, to make room to lay more, or for any other reason, you may thrash it out, and at one End of the Barn lay a Layer of Straw of about a Foot thick, and upon that a Layer of Corn and Chaff mixed together, and upon that another Layer of Straw, which continue till your Corn is all laid up ; or you may mingle your old thrash'd Corn with the Straw of the new : Either of these ways you may keep it as long as you will. And I think this the best way ; only I know some will pretend a mighty Inconvenience in this Sort of Barn, because they cannot run a Load of Corn into it, if wet comes. But that Inconvenience may be easily remedied by having a large Barn for Hay near it, with a Porch to run it into. They that have none of these Conveniencies, but are obliged to lay their Corn in a common Room, let them make a hole in the Door to let the Mice and Rats in and out at, and stop all the other holes that the Mice or Rats make in the Room with Wool dipped in Tarr, and to the hole in the Door have a small Scuttle to shut down when you go in to keep in what Mice or Rats are there ; and round the Room, about four Foot high from the Ground, place a shelving Board that the Mice and Rats may not run up the Walls ; and with Brooms, &c. you may kill a great many of them. But for Barns, I think those boarded on the sides the best, being the least subject to harbour Mice of any.

I shall conclude this point with some particular Remarks, upon the keeping of several Kinds of Corn.

First of *Wheat*, which is the most principal Grain, *Wheat*. and of greatest Use and Price, being the most tender and aptest to take hurt of any ; and therefore ought not to be laid above a Foot thick on the  
I 2 Floor,

Floor, and observe that the Corn you intend to keep, be had in dry ; and that no Wheat that is thrashed before *March* is fit to keep long. In moist Weather (if it be not kept in the Straw or Chaff) take care to turn your Wheat once in four or five Days.

*Rye.* *Rye* is much of the same Nature with Wheat, and is to be treated after the same Manner.

For the keeping of Meal, there is no better way than first to bolt it, and scarce it from the Bran, which is very apt to corrode and putrifie it, and make it musty. You may put it into clean dry Casks, that are tight and well bound, treading of it in as hard as possible you can, and then head it up close.

*Beans.* *Beans* are a more gross sort of Grain than Wheat, and more subject to be moist and to give in the Mow ; and therefore those that are to be kept are not to be thrashed 'till *March*, that they have had a thorough sweat in the Mow, which they are very apt to ; because Beans and Pease are not all ripe together, and so the green do often heat the ripe, and the ripe so heated give fire to the green, 'till both be either rotted or consumed ; to which also the bigness of their Leaves, and hardness of their Stalks, which continue moist and sappy a long time, doth much contribute ; for which reason they commonly chuse rather to stack them without doors, than to house them, that so the Sun and Air may dry them. But the best way is to kiln-dry them, or to dry them well in the Sun, and then they will keep many Years, though they are laid never so thick, and are not turned, or any care taken of them : For Beans never give again if they are once thorough dry

*Pease.* *Pease* are esteemed, of all Grain whatsoever, the most subject to rottenness and imperfection ; because they are very apt to breed Worms, Weevils, and

and Mites, by reason of the lusciousness and sweetness of the Grain. They are to be ordered much as you order Beans; the drying of them either in the Kiln or Sun, being the best way to preserve them, and likewise to make them fit for the feeding of Cattle; because the drier they are, the more thirsty they make them, it being a general observation, that if Cattle drink well, they will feed well; but what you keep for food must not be too much dried, because it will make them take up double the time in boiling.

If you lay them in Granaries, 'tis best to lay them in thick Heaps, or in Bins; for that will preserve them moist the longer; for the spreading of them thin on a Floor dries them too soon, and taketh from them much of their sweetness and goodness. But the best way to keep those that you design for your own spending, is to thrash them as you use them, or to put them into close Casks, and head them up.

*Oats* are the least subject to the breeding of Vermin of any Grain, and are defended with a double Husk. The best way to keep them after they are thrashed, is to dry them well either on a Kiln, or with the Sun, and to keep them in Hutches, or close Casks, observing that they must not be thrashed before *Christmas*; because they are not fit for keeping before that time.

*Oats.*

*Barly*, if it lie in the Mow unthrashed, will keep well for one Year, but when it is made into Malt, which must be done before the heat of Summer comes on, it must not be kept above a Year and a half, or two Year at most; if you do, it will be filled with Weevils; but if the Weevils do get into it, Wormwood laid in the Malt is a good thing to kill them, and likewise Oak-ashes. Bins are the best things to keep it in.

*Barly.*



*Musty.* But if it happen, that you have any Corn by the moisture of the Weather, or neglect of turning, that proves *Musty*; I am told that if you spread it thin on a Cloth, and lay it out all Night in the Dew, and dry it next Day in the Sun, it will make it sweet.

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### Chap. X. *Of Thrashing and Cleansing of Corn.*

**I** Wish some better Methods were found out for the Thrashing and Cleansing of Corn from the Chaff, than is; and for those ways that are found out, I think, for the Cleansing of Corn, that in most places the worst way is commonly made use of; which is either a Wicker-fan, or a Fan with Sails: Whereas I am satisfied that one Man with a Casting-shovel, which is used but in few places, will cleanse as much Corn in a day, as four Men with either the Wicker or Sail-fan.

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### Chap. XI. *Of Hemp and Flax.*

**H***emp* and *Flax* are Commodities that deserve better Incouragement than they meet with amongst us, both for their Usefulness and Profit: But we are got into the way of a Foreign Trade for them, and so are altogether remiss about their Incouragement; though they are what not only deserve the Care of particular Persons, but of the Government too.

*Hemp.* *Hemp* delights in a black rich Mould; the richer and stronger, 'tis the better, if it be warm and dry. I have known extraordinary Crops of *Hemp* on Lands where Hay and Wood-stacks have stood. Though where Land is a little sandy or gravelly, provided it be rich and of a deep Soil, it will do well;

well : But it will not thrive on cold Clays, or Land that is wet or moorish. 'Tis very good to destroy all sorts of Weeds ; but as 'tis esteemed a Peeler of Land, 'tis best to sow it upon Lands that are rank, and not to repeat the sowing of it too often upon the same Land.

The best Seed is the brightest, and that which will retain its Colour and Substance when rubbed. Three Bushels will sow an Acre. The richer the Land is, the thicker it must be sown ; and the poorer the thinner. Some do not give the Land a plowing 'till just they sow it ; but others order it as for Barly ; and when they sow it, they make the Mould very fine like Garden-ground : And they observe not to lay it too deep in the Ground, but to cover it as lightly as they can. From the beginning to the end of *April*, is the time of sowing of it, according as the Spring falls out earlier or later, but the earlier 'tis sown, the better ; if 'tis a dry time, it must be carefully preserved from the Birds who are very greedy Devourers of the Seed.

The Season of pulling of it is first about *Lammas*, when a good part of it will be ripe ; that is the light Summer-hemp that bears no Seed, which is called Fimble-hemp : When 'tis ripe the Stalks grow white, and the Leaves fall downwards, turning yellow at the top ; it must then be pulled forth, dried, and laid up for Use. You must be cautious not to break what you leave ; lest you spoil it, because 'tis to grow 'till near *Michaelmas*, before it will be ripe : This is usually called Karle-hemp. When you have gathered it, bind it up in bundles ; the Fimble-hemp in small bundles as big as may be grasped in both hands ; and the Karle-hemp in Bands of a Yard-compass ( according to Statute-measure ) which some lay in the Sun three or four Days to dry, and then stack it up, or house it, so as to keep it dry, 'till they can thrash out the Seed.

An Acre of Hemp in the best Land, commonly yields about two or three Quarters of Seed, and the Seed with the Hemp unwrought is worth often from five Pound to eight Pound, but if wrought, from ten Pound to twelve Pound, or more. But the Fimble-hemp is not worth above half so much as the other. 'Tis a very great help to the Poor; the Hemp-harvest coming after the other Harvest, affords them continual Employment in the bad, wet Winter-seasons, and to such as are not capable of better Work.

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## Chap. XII. *Of Flax.*

**F***lax* is also a very excellent Commodity: The tilling and ordering of which is a very good Piece of Husbandry: It will thrive in any good sound Land whatsoever, but that is the best for it that hath lain long unplowed; and the best and richest Land yields the best Flax, and makes the best Improvement: But as it robs the Land much, so the rankest Land and the seldom sowing of it upon the same Ground is best (as was said before of Hemp.) The Land must be well plowed, laid flat and even, and the Seed sown in a warm Season; about the middle of *March*, or beginning of *April*, is the common time for the doing of it: And if a wet Season happen, it will require careful Weeding.

The best Seed is that which comes from the East Country, although it cost dear; it will last well two or three Crops, and then must be renewed again: Of the best sort of Seed two Bushels will sow an Acre; but there must be more of other Seed: You must be careful that it grow not over ripe; it ripening something after the Hemp, must be pulled as soon as you see the Seed begin to grow brown and bend



bend its Head downwards; at which time let the Pluckers be nimble, and tye it up in handfuls, setting them up 'till they be perfectly dry, and then house them. If Flax is pull'd when 'tis in the Bloom, it will be whiter and stronger than if let stand 'till the Seed is ripe; but then the Seed will be lost.

But the Method and Way of Watering, Pilling, Braking, Tewtawing, &c. of Hemp and Flax, being a particular Business that requires them that are used to it, and have knowledge in it, I shall leave it to such as are experienced in it, and only note, that in *Nottingham* and *Derbyshire*, where a great deal of Linen is made, they have a good way to save the laborious Work of beating of Hemp; by making the Axle-tree of their main Wheel of their Corn-mills longer than ordinary, and placing of Pins in them to raise large Hammers like those used for Paper and Fulling-mills, with which they beat most of their Hemp.

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### Chap. XIII. *Of Rape and Cole-Seed.*

**R***Ape* and *Cole-seed* is another excellent Piece of Husbandry and Improvement of Land, especially Marshy or Fenny Lands newly recovered from the Sea, or any rich rank fat Lands; the ranker they are the better: But they will do well on any Lands that are dry and warm. The best Seed is that which is biggest, fairest, and of a clear Colour like the best Onion-seed, and dry; 'tis usually brought from *Holland*; but a great deal that is very good grows here.

The time of sowing of it is about *Midsummer*; the Land being fallowed in *May*, must be twyfallowed in *June*, and made very fine, and laid even before 'tis sown. About a Gallon or four Pound will sow an Acre, 'Tis sown for two Uses; for the Seed,  
or

or for Winter-food to feed Sheep, Cows, &c. in *January, February* and *March*, when other Food is wanting; for which use it turns to great advantage in the more ordinary sort of Lands, it being only in the richest Lands, that 'tis best to be kept for Seed, because it there grows rankest and strongest: And when it hath been cut, the Stubs of it will sprout again, and afford excellent Nourishment for Sheep: Only when Sheep are first put into it, care must be taken for the first four or five Nights, to put them out into some Grass-grounds, because Coles are apt else to make them swell, and to fill them with Wind like Clover. When it is cut for Seed, they commonly reap it, as they do Wheat; and when one half of the Seed begins to look brown, is the time to cut it: They lay two or three handfuls of it together to dry, which commonly takes up near a Fortnights time, during which it should not be turned, lest the Seed shed, which 'tis very apt to do: And therefore when they gather it, they do it carefully into large Sheets, in which they carry it into the Barn, and thrash it out immediately: But in *Lincolnshire* they commonly thrash it in the Field upon a large Sheet, having under it levelled a piece of Ground for that purpose. Its common Produce, where it is good, is five Quarters upon an Acre, which is usually sold for about five Pound. The common use of it is to make Oil: 'Tis a very good preparer of Land for Barly or Wheat.

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#### Chap. XIV. *Of Turneps.*

**T***urneps* are of three Sorts; the round which is the most common; a long Sort that grows much in *Suffolk*, and the yellow Turneps: These are commonly sown in Gardens, but are of very great

great Advantage to be sown in Fields, not only for the use of the Kitchen, but for Food for Cattle in Winter, when other Food fails: They delight most in a warm, mellow, light Land, that is rather sandy than otherways. A Pound and a half or two Pound will sow an Acre. They are commonly sown at two Seasons of the Year; in Spring for to run up to seed that Summer, which is used to sow again, or to mix with Cole-seed to make Oil of, where they have a Quantity; or at *Midsummer*, the Land being first plowed in *May*, and twy-fallowed in *June*, and made very fine. The Seed being harrowed in with a Bush, they rowl the Land with a wooden Roll to break the Clods; and with the Turneps sow'd at this Time of the Year they feed Sheep, Milch-cows, or fatting Cattle, about *January*, *February*, or *March*: But for fatting Cattle they commonly in *Suffolk* give the Turneps to them in the House, which they pull up, and carry to them twice a day, either in a Wheel-barrow or in a Cart, according to the Number of Cattle they have. They used to cut them in small pieces, which now they find an Inconveniency in, because the Cattle were apt to swallow them without chewing, which often choaked them; and therefore they now give them whole. In feeding of Cattle with them in the House, they propose two Advantages; one is, that it prevents the Cattle spoiling of them with their feet; and the other is, that they reckon the Cattle so kept up, do fat much sooner and better than those that ramble about. Hogs also will eat them, if they are first boiled; only you must observe, that what Cattle you fat with them, for about a Fortnight before you kill them, they must be fed with Hay or other Provender to prevent their Flesh from tasting of the Turnep. They are a very great help in dry barren Lands, and will grow almost in any sort of Ground; only the Fly is sometimes apt to eat them  
at



at their first coming up; but if they do, there is no great loss in sowing of them again, the Seed being so cheap, and so small a Quantity sowing of an Acre. But to prevent the Fly, some propose to sow Ashes with the Seed, and others to sow Soot just at their first coming up; but I have not experienc'd the benefit of these ways. There is likewise a black sort of Catterpillar that doth sometimes eat them; which if you find, the best way is to rowl them with a wooden Roller, which will crush them to pieces; especially if done in a dry time, and will do the Turneps no hurt, but rather make them root the better. If your Turneps come up too thick, it will hinder the growth of the Root, which is the chief part to be taken care of; and therefore if they come up too thick, they should be thinned with a Hoe; for which work where a Man hath Fourteen-pence a day, they commonly give from four to nine Shillings an Acre, because this Work they sometimes do twice over, if the Turneps thrive and flourish much. If too much Wet, or the Richness of the Ground cause them to run too much to Leaves, which is a Fault in Turneps, the feeding of them, and treading down some of the Leaves, will help their rooting. Some sow them upon their Stubble as soon as the Corn is off, and only harrow them in, and reserve them 'till late in the Spring for food for Ewes and Lambs or fattening of Cattle; especially if you sow them on Land that you design to fallow, you may then reserve them 'till *April*, which is the scarcest time for Food for Cattle of the whole Year, especially for Sheep and Lambs; but then you must have a mild Winter: And if the Hardness of the Winter should spoil them, neither the loss of Seed nor Labour will be much. Many sow Cole-seed and Turnep-seed together, which do very well, because the Profit of the one lies in the Tops, and of the other in the Roots.

Chap. XV.

Chap. XV. Of *Madder*.

**M***adder* is esteemed a very rich Commodity, and what will turn to good profit; so that in King *Charles I's* Time it was made a Patent Commodity. 'Tis used by the Dyers for making of the most solid and richest Red, and by the Apothecaries for its medicinal Virtues. There is but one kind of *Madder* that is manured and fit for use, though there are many things like it, and that are reckoned a wild sort of it, as Goose-grass, Ladies Bedstraw, Woodroof, and Crosswort: The right sort hath long Stalks and trailing Branches, rough and full of Joints, every Joint being set with green rough Leaves, in manner of a Star: The Flowers grow at the top of the Branches, of a faint yellow Colour; after which comes the Seed, which is round and green: The Root creepeth upon the ground, intangling of one Root into another; and when it is green and fresh, is of a reddish Colour: 'Tis small and tender, and runs on the Earth, like Ivy along a House or Tree; and tho' it bears a Seed, it comes to no Perfection, but is raised out of Setts, which may be had of the Gardeners about *London*. In *March* and *April* is the time of getting of them, as soon as they spring two or three Inches out of the Ground; be careful to have them well rooted, and that every Sett have some Suckers or Spines of Roots going out of them. They must be slipped from the main Root, and as soon as ever they are taken up, put into a Basket with a little Mould, and set as soon as they can. 'Tis to be planted in a very rich, deep, warm Mould, digged two full Spits deep, and raked very fine, planting every Sett about one Foot asunder every way: And if it be a dry Spring, they must be kept continually with watering until they begin to sprout, and be continually

nually kept with weeding and hoeing until it hath got the mastery of the Weeds. You may sow some early Sallet-Herbs, as Radishes, Onions, or such things as will be ripe betimes, amongst it. In case any Setts die, you must set new in their room. The time of its growing 'till it comes to Perfection is three Years: The first Year you may take off some few Setts here and there, but that is something dangerous; but the second Year you may take off what Setts you will, if you leave but the main Root: In the taking up of every Root there will be one Runner, which hath little Buds on it, which may be divided and cut into a Fingers length; so that each Sett be planted with one Bud out of the Ground, one Runner will make many Setts; but these Setts cannot be taken up 'till the Madder be taken away: And having preserved it until it come to a good Crop, and dried it as you do Hops, to a just and perfect Gage of Drought, you must pare off the Husks of the outside (in which there is an Art) which will be worth not above nine or ten Shillings a hundred, which they call Mull-Madder; but the second Sort called Number O, which is the middle Rind, is much better, but not so good by a sixth Part as the third Sort, which is called the Crop-madder, which is the Heart and Pith of it, inclining to a yellow Colour. Sometimes the best Madder is worth eight or nine Pounds a hundred, and the Number O six Pounds ten shilling, and sometimes not above four or five Pounds a hundred. The Dyers use great Quantities of it; many of them an hundred Pounds worth in a Week: So that if it were more propagated, there would be vent for it. Some tell you of two or three hundred Pounds made of an Acre of Land planted with Madder, in three Years time.



## Chap. XVI. Of Woad.

**W**Oad or Wade is a very rich Commodity, and worth the Husbandman's taking notice of; 'tis used by the Dyers to lay the Foundation of many Colours, especially all sad Colours. It requires a very rich Soil that is dry and warm; if it be a little gravelly or sandy it will do well, if it have long rested, and be in heart; but the richest Garden Earth near great Towns is the best, tho' 'tis sown in many other places. If 'tis long continued it robs Land much; but moderately used, it prepares Land for Corn, abating the over-much Fertility of it where Land is too rank. The Land for this Seed must be finely plowed, harrowed, and all the Clods and Turfs broke, and the Stones picked up, and carried off. The time of sowing it is about the beginning or middle of *February*. 'Tis continually to be weeded; but if it come up good, it will need the less weeding. The common price of weeding of it is about Eight-pence an Acre. 'Tis ripe when the Leaf comes to its full growth and retains its perfect Colour and lively Greenness, which is sometimes sooner and sometimes later, as the Year proves dry or moist. As soon as 'tis fit to cut, let it speedily be done, that it may not fade, nor wax pale. Good Woad may yield in a plentiful Year five or six Crops; but it ordinarily yields but four, sometimes but three; especially if you let it grow for Seed; what grows in Winter they do not use, but 'tis very good Food for Sheep: The two first Crops are the best, which are usually mixed in the seasoning; the latter Crops are much the worse, which, if mixed with either of the former Crops, spoil the whole.

When

When it is cut, it must immediately be carried to the Mill; the manner whereof, with the way of ordering it, is best learned from experienc'd Workmen, and is not to be trusted to from a bare Description of it. It many times sells from six Pounds to thirty Pounds a Tun, an Acre commonly yielding about a Tun.

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Chap. XVII. *Weld or Dyer's-weed.*

**W***Eld* or *Woald* is a rich Dyer's Commodity, and is of great Advantage, considering the easie Charge of raising it. It grows in many places wild, and will grow upon the barrenest sort of Land, tho' the middling sort of Land is best for it. If it be dry and warm, it requires no Tillage. The Seed being sowed with Barly or Oats, and only harrowed in with a Bush, or rolled with a Roller. The greatest difficulty is the sowing of it even, it being a small Seed. A Gallon of it will sow an Acre. It grows not much the first Summer; but after the Corn is cut it must be preserved, and the next Summer you will receive your Crop.

You must be very cautious in the gathering of it, that the Seed be not over-ripe to fall out, and that neither the Stalk nor Seed be under-ripe; because if 'tis, both will be spoiled. 'Tis to be pulled and bound up in little handfuls, and set to dry, as you do Flax, and then house it carefully, that you spill not the Seed, which may be beat out presently, or kept 'till *March*; only you must take care to keep it as dry as you can. The Seed sells for about ten Shillings a Bushel, or more. The Dyers use it for dying of bright Yellows and Limon-colours. 'Tis much sown in *Kent*, especially about *Canterbury*, and often yields from forty Shillings to ten or twelve Pounds an Acre.

Chap. XVIII.

Chap. XVIII. *Of Liquorice.*

**L**iquorice delights in a warm, rich, black Earth, that is well dunged and very deep; because in the length of the Root consists the greatest Advantage: And therefore 'tis much planted near *London* and some other great Towns where is plenty of Dung; tho' the most noted places are *Pontefract* in *Yorkshire* and *Godliman* in *Surry*, which is pretty much of a sandy Soil; only it may be much improved near the Town by Dung, which may make it a rich Garden-mould. The Land for Liquorice must be trenched very deep, at least three Spits or more, and laid as light as possible it can be. The best way is to dig the Dung in the beginning of Winter, and then to dig it again at planting time, which will lay it much the lighter, and mix the Dung the better: The oldest Dung, that is almost turned to Mould, being the best for this Use.

Procure your Setts from the best and largest Liquorice: The best Setts are the Crown Setts or Heads got from the very Tops of the Root: The next sort are the Runners, which spread from the Master-roots, and have little Sprouts or Roots to them, which being cut four or five Inches long make excellent Setts; the Branches also may be slipped and planted; and if it prove a wet Year, they will many of them grow, and serve to thicken your Plants when they are thin.

The usual time of planting of Liquorice is in *February* and *March*, which they set in rows by a Line at about a Foot distance, making holes with a Setting-stick deep enough to contain the Plant; which you must earth up as soon as you can, because the Setts are impatient of being planted; and therefore where they are removed far, they should be carried in Earth, and the Ground should be



be made ready before-hand. If the Earth is dry, water them as soon as set, which continue to do several days, 'till you find they have recovered their Witheredness. The first Year you may sow the Ground between them with Onions, Lettice, and such like Herbs.

The time for digging of the Liquorice up is in *November* or *December*, after it hath stood three Summers ; for then it weighs most, and will keep best for some time ; but the sooner 'tis disposed of, the better ; because while it is green and new, it will not lose of its weight. Some that have had good Liquorice have gained much by it. The better the Land is, the more is the Advantage. There have been made from fifty to a hundred Pounds of an Acre of Liquorice, as some affirm.

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### Chap. XIX. *Of Saffron.*

**E**Nglish *Saffron* is esteemed the best in the World, and is a Plant that suits our Climate and Soil. It delights in a good, dry, sound Land brought into perfect Tillage, and made mellow by Manure and good Husbandry : The lighter and richer your Land is, the better Crop you may expect. The time of planting it is about *Midsummer* ; some say that *March* is the best time. It is increased by the Roots, which yearly multiply in the Ground like other Bulbous Roots, or rather more. They are to be taken up and new planted once in three Years, and then many of the Roots may be obtained, which they commonly sell by the Bushel. The way of setting them is in ranges, which they make with a large Hoe about two or three Inches deep, like a Furrow ; in which Ranges they set the Roots two or three Inches asunder, but the Ranges are four or five Inches distant, for the more convenient

nient weeding and hoeing of them : And after one Range is set they begin another, and with the Earth of this second Range they cover the first, and so continue their Work 'till finished, making each Range or Furrow, as near as they can, of a depth.

About *September* the Flowers appear like a blue *Crocus*, and in the Middle of it come up two or three Chives which grow upright, when the rest of the Flowers spread abroad ; which Chives are the Saffron, which you must gather gently with your Finger and Thumb early in a Morning, or else it will return into the Body of the Flower again, which you may continue to do for about a Months time ; for which Work you must provide as many hands as the Quantity of the Land will require. You may gather two or three Crops, and then remove it to fresh Ground. After it hath done flowering it remains green all the Winter ; but the tops, in the beginning of Summer, die wholly away to all Appearance, which time is one of the chief Seasons for hoeing it.

Care must be taken in the drying of it, which may be done in a small Kiln that consists of an oaken Frame, lathed on every side, twelve Inches square in the bottom, and two Foot high, and two Foot square at the Top ; upon which is nailed a Hair-cloth strained hard by wedges drove into the sides with a square Board, and a Weight of about a quarter of a hundred to press it down : The inside of the Kiln is covered all over with Potters Clay very well wrought with a little Sand, a little above two Inches thick : The bottom must be lined with Clay four or five Inches thick, which is the Hearth to lay the Fire on, wherein must be a hole to put in the Fire. The outside may be plastered over with Lime and Hair. It must be dried with a very small Fire, and will require constant Attendance : Three Pound of it moist usually produces

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duces one Pound dry ; and an Acre of Land may bear from seven to fifteen Pound, and is commonly sold from twenty Shillings a Pound to five Pounds a pound, as the Markets happen. They commonly compute the Charges of it at four Pounds an Acre, which gives room for a considerable Advantage.

*Safflow.* In *Oxfordshire*, about *Norton* and *Ashton*, grows a Sort of Herb that they call *Safflow* or *Bastard Saffron*, which the Dyers use for the dying of Scarlet, which they plant in rows about a Foot distant for the Conveniency of hoeing it. It grows upon a round Stalk three or four Foot high, and at the Top bears a great open stalky Head, out of which are thrust forth many Gold-coloured Threads of a most shining Colour, which they gather every day as they ripen, and dry them.

## Chap. XX. Of Hops.

**H**ops are a very valuable Commodity ; only as they require a great deal of Care and Industry, so few make that Profit of them that they might do. They delight most in rich black Garden-mould that is deep and light, and that is mixed rather with Sand than Clay ; but most Sorts of Lands will do for them, unless stony, rocky, or stiff Clays, which are not to be commended for the Hop. In *Kent* they reckon new Land best for Hops, and therefore they plant their Hop-gardens with Apple-Trees at a large distance, and with Cherry-Trees between ; that when the Land hath done its best for Hops, which they reckon it will in about ten Years, the Trees may begin to bear ; the Cherry-Trees last about thirty Years, and by that time the Apple-Trees are large they cut down the Cherry-Trees.

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Where Land is any thing sowre or cold, burning of it is a very great help to it ; and if the Haum and Strings of the Hops be burnt every Year, and some of the paring of the sides of the Garden or other Earth be laid on them as they burn, and then more Haum laid over them, and so continued Layer upon Layer, it will make excellent Compost to make the Hills with : If you can obtain a piece of Land a little inclining to the South that lies low and warm, and that is defended by Hills or Trees from impetuous Winds, and where such a Fence is wanting may be planted with shelter, and that is of a deep Soil, and where Water may be at command in Summer-time, it is the best piece of Ground for a Hop-garden.

The Ground you design to plant, must, the beginning of Winter, be plow'd or digg'd up, and laid very even; cross which stretch a Line in which Knots are tied at such distances as you design your Hills. Some plant them in Squares, Chequerwise, which is the best way, if you intend to plow with Horses between the Hills ; others plant them in form of a Quincunx, which is the more beautiful to the Eye, and better for the Hop, and will do very well where the Ground is but small, that you may overcome it with the Breast-plough or Spade : But which way soever it be, pitch a small Stick at every place where there is to be a little Hill; and when it is so done, if your Ground be poor or stiff, or not rich enough, bring into it the best Mould you can get, or Dung and Earth mixed together, and at every Stick dig a hole of about a Foot square, fill it with your Mould or Compost, and setting your Plants in it they will thrive the better, and the sooner come to bear.

There is great Variety both in the Judgment and Practice of most Men about the distance of the Hills, by reason of the different Seasons of the Year,

*To prepare  
the Land.*

*Distance of  
the Hills.*

as being too dry or moist. If your Ground be dry and burning, about six Foot may be a convenient Distance ; but if it be a moist, deep, rich Soil, subject to bear large Hops, then eight or nine Foot is the most convenient ; and so, according to the Goodness of the Soil, you must place the distance of the Hills where you have a new Ground to plant ; but in an old Ground, if your Hills are too far asunder, the best way to remedy that Inconvenience is by increasing the Number of the Hops in the Roots in each Hill, by which means you may apply more Poles, for Hills may be made of that bigness to require six, ten, or twenty Poles ; and if your Hills are too near together, you may also abate Hops, and apply the fewer Poles ; for overpoling of a Ground as well in number as height, injures it more than under-poling.

*Time of  
Planting.*

Some advise the planting of Hops in the end of *March*, or in *April* ; but the best experienced Planters prefer *October*, before the Cold of the Winter, and say, that then the Hops will settle and strike Root against Spring. Choose the largest Setts you can get, which are to be had best out of Gardens well kept, and where the Hills have been raised very high the precedent Year, which increaseth the Plants both in number and bigness. Let them be about eight or ten Inches long, and have three or four Joints or Buds. Before you have your Setts out of the Ground, make the Holes ready to put them in if you can, else you must lay them in cold moist Earth, and take them out as you have occasion for them. Dig your Holes according to the depth of your Plants, eight or ten Inches deep, and about a Foot over. Some take two or three of the Plants and join them together with one hand while they fill the Hole with fine Mould prepared and made ready for that purpose, observing to set the Tops even with the Surface of the Earth, and the same

same end uppermost that grew so before, and then they fasten well the Earth about the Roots. Others place at each Corner of the Hole a Plant, which way is to be preferred before the other. It is convenient to raise the Earth two or three Inches above the Setts, unless you plant so late that the green Sprigs are shot forth; then you are not to cover them wholly, lest you spoil them. Beware of wild Hops, which are only discovered by the Stalks and Fruit.

If your Hops are old and ill-husbanded, or worn out of heart, then about the beginning of Winter dig about them, and take away as much of the old barren Earth as you can, and apply good fat Mould or Compost to their Roots: If you cannot do it so soon, do not neglect it longer than *January*, or *February*, if the Weather be open, such Winter-dressings being a principal Renewal of decayed Hops; it will likewise kill the Weeds, Quitch-grass, &c. But if your Hop be in good heart and strong, dressing of them in *March* is most proper: Some do it in the beginning of *April*; it will restrain their too early springing, which is the cause of many Injuries to the Hops, and kills the Weeds the better.

In dressing of Hops you must pull down your Hills, and undermine them round about 'till you come near the principal Roots, and then the upper or younger Roots. Shake off and remove the Earth away from them with your hand; you may see where the new Roots grow out of the old Setts: In the doing of which, be careful of the old Setts; but for the other Roots, they are to be cut away. You shall not need to spare them to the delay of your Work, except such as you mean to set; and take heed that you uncover not any more of the Tops of the old Setts in the first Year of cutting: And at what time soever you pull down your Hills,



do not cut your Roots 'till *March*. When you first dress your young Hops, cut away all such Roots or Sprigs as grew the Year before. Cut off your Setts within one Inch of the same. Every Year after you must cut them, as close as you can to the old Roots, but to a weak Hop some of the chief of the new Shoots are to be left at dressing; the not observing of which hath often much decayed a Hop-garden. The Roots that grow downwards are not to be cut, 'tis only those that grow outward at the sides of the Plant that are to be meddled with, because they will else incumber the Ground. The old Roots and the young may be distinguished, in that the first are red, and the latter white. If there are any wild Hops, you must take up the whole Hill and new plant it, marking the Hill with a Stick at Hop-harvest-time to prevent Mistakes. When you have dressed the Roots, apply your rich Mould or Compost to them, and make not the Hills too high at first, lest you hinder the young Shoots: And if the Hops are springing out of the Hills, you need not fear cutting them off when you dress them; and be sure to keep all Poultry out of the Hop-ground, especially Geese.

*Paling  
Hops.*

The Number, Length, and Bigness of the Poles are to be provided according to the Distance of the Hills, Nature of the Ground, and Strength of the Hops. If the Hills are wide, there must be the more Poles, sometimes four or five to a Hill; if the Hills are near, two or three may suffice. In hot, dry, hungry Ground, the Poles may stand nearer than in rich mellow Land, where they are more subject to grow gross and heavy. Also if your Hops be strong, and your Ground rich, provide large Poles either in Bigness or Length, or else you will lose the best of the Profit for want of Poles; but if they are poor, provide but small Poles, lest you impoverish the Root; for the Hop will

will soon run it self out of heart if over-poled; more especially be sure not to over-pole them for length the first Year. Ash and Alder-poles are reckoned the best; and if they have a small Fork at the end, it will keep up the Hop the better. Disperse your Poles between the Hills before you begin to pole, and begin not to pole 'till your Hops appear above the Ground, that you may discern where the biggest Poles are required, and so you may continue poling 'till they are a Yard in height, or more; but stay not too long, lest you hinder the growth of the Hop, which will not grow large, unless it have a Pole or such like to climb up on. Set the Poles near to the Hill, and in depth according to the height of the Pole, Nature of the Ground, and to its being exposed to Wind, that the Pole may rather break than rise out of the Ground. Let the Poles lean outward one from another, that they may seem to stand at an equal distance at the top to prevent Houssling, as they call it; and let them lean towards the South, that the Sun may the better shine amongst them: For 'tis evident that a leaning or bending Pole bears more Hops than an upright one. Always have some spare Poles in reserve in case any Poles break or be over-burden'd, to support them; for if they lie on the Ground they soon perish. With a Rammer you may ram the Earth at the outside of the Pole, for its better security against the Wind. If after some time of growing you find a Hop over or under-poled, you may unwind it, and place another Pole in its place, or you may place another Pole near it, and bring the Hop from one Pole to another.

When the Hops are got two or three Foot high, *Tying of Hops.* they are to be conducted to such Poles as you think fit that are nearest, and have fewest Hops; wind them about the Poles according to the course of the Sun, to which they should be gently bound with

with some wither'd Rushes or woollen Yarn : Two or three Strings are enough to a Pole. Be cautious of breaking the tender Shoots, which are more tender in a Morning than in the heat of the Day. During *April* and *May* Hops should be constantly tended to guide them to their Poles, which may be done with a forked Stick, or a Ladder with a Stay to the back, where they are out of reach. About Midsummer, or a little after, the Hops begin to leave running at length, and to branch; such as do not, it may be convenient to nip off the top, or to divert it from the Pole, that it may branch, which is much more for the benefit of the Hop than its running of its self out at length.

Sometimes in *May*, after a Rain, pare off the Surface of the Earth with a Spade, Hoe, Breast-Plough, or a Plough with one Horse, and with the Parings raise your Hills high, and enlarge their breadth, burying and suppressing all superfluous Shoots of Hops or Weeds; by which means you will keep the Weeds from impoverishing of your Hops, and keep your Hills moist. This Work may be continued throughout the Summer, especially after Rain.

*Watering  
of Hops.*

In a dry Spring, where Water is to be had, 'tis of great advantage to water them : The first watering is best to be done before you lay the Parings of the Garden upon the Hills : If the Summer prove dry, watering may be repeated three times; and after every watering make up the Hills with the Parings and with the Weeds to keep the Hops moist, for the more the Hop is shaded from the Sun, the better it thrives, as is evident by such as grow under shelter, that are never drest, and yet may compare with those that the most care is taken of.

*Gathering  
of Hops.*

Towards the End of *July* Hops blow, about the Beginning of *August* they bell, and are sometimes ripe, in forward Years, at the End of *August*, or Begin-



**Beginning of September.** At such time as the Hops begin to change colour, or that they are easily pulled to pieces, or that the Seeds begin to look brown, and smell fragrantly, you may conclude them ripe, and then procure what help you can for a quick gathering of them; for one windy Day or Night may otherways do much mischief.

The Manner of gathering Hops, is to take down four Hills standing together in the midst of the Garden, and to cut the Roots even with the Ground, and laying of the Ground level, they throw Water on it, and level and sweep it, and so make a Floor of it on which they lay the Hops to be pick'd. On the outside of this Floor the Pickers sit, and pick them into Baskets after the Vines are strip'd from the Poles: The Floors they clean two or three times in a Day. Always in this way of picking 'tis necessary to have the Poles without Forks, otherwise it will be troublesome to part the Hop-Vines and the Poles.

But the best and most expeditious way, and which is most used, is to make a Frame with four short Poles or Sticks laid on four Forks driven into the Ground, of such a Bigness as to be covered with the Hair-cloth of your Kiln, or a Blanket tack'd about the Edges; on which Frame they lay the Poles with the Vines on them; either supported with Forks or the Edges of the Frames: The Pickers standing on each side pick the Hops into the Hair-cloth or Blanket: When the Blanket or Hair-cloth is full, they untack it and carry it away, and empty it or put another in its room; which Frame may from time to time be easily removed from one place in the Garden to another, as they find occasion: This way keeps the Hops clean, and saves a great many that otherwise are lost by tumbling them about.

Before you draw your Poles, with a sharp Hook fixed at the End of a long Pole, divide your Hops above where they grow together with other Poles; then ought you to cut the Hops about two or three Foot above, and not close at the Hills, because it occasions the Hop to bleed too much of its Strength away, and weakens them very much. Then draw your Poles; but in case they are so fast in the Ground that they cannot be raised without breaking, you must get a Pair of Tongs like a Smith's Tongs, only stronger, and toothed at the End; with these Tongs taking hold of the Pole, and resting of the Joint thereof on a Block of Wood, you may weigh up the Poles without trouble; or, for cheapness sake, you may have a wooden Lever forked at the Ends, into the sides of which drive some Iron-teeth, which put to the Pole, and by the strength of your Right-hand, whilst you pull the Pole to you with your Left, you may raise it. Cut no more Hops, nor draw any more Poles, than you can conveniently dispatch in an Hour or two in case the Weather be hot or likely to rain.

If your Hop-garden be large, it may be worth while to raise a Shed in the midst of it to shelter the Pickers and the Hops from the Sun and Rain, and to lay Hops in over-night for the Pickers to pick next Morning before the Dew is off your other Hops. Let not your Hops be wet when you gather them; but if the Dew or Rain be on them, shake the Pole, and they will dry the sooner. If your Hops be over-ripe, they will be apt to shed their Seed, wherein consists the chief strength of the Hops: Also they will not look so green, but somewhat brown, which much diminisheth the Value of them: Yet some let them stand as long as they can, because they waste less in the drying; for four Pounds of undried Hops, thorough ripe, will make one of dry; and five Pounds of Hops scarcely

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ly ripe, yet in their prime, makes but one: So that they judge they get more in the thorough-ripe Hop by the Weight, than they lose in the Colour.

There are also two Sorts of Hops, the green and the brown; the one yielding the best Colour by much when they are dry, and the other bearing a larger and a greater Quantity of Hops, which is to be preferred. In the picking keep them as clean as you can from Leaves and Stalks, which will damage you more in the Sale than they will advantage you in the Weight.

As fast as you pick your Hops, dry them, for their lying undried heats them, and changes their Colour: But if your Kiln be full, that you cannot do it presently, spread them on some Floor, that they may not lie thick, and thus they will keep a day or two without damage, if you have a great Quantity; but if your Number be small, and you have room to lay them very thin, if you take care to turn them often, you may this way dry a small Quantity better than any other way. The well drying of Hops is the most necessary thing to be taken care of; for if that be not rightly done, they are not fit for the Market, nor for use: For a handful of slack-dried Hops will marr and spoil many Pounds by taking away their pleasant Scent and Colour: Therefore let your Hops be thoroughly and evenly dried: Which to accomplish, there are several ways used; as first,

The way used by the *Hollanders* and *Flemmings*, Oost or Kiln. is to make a square Room or Kiln about eight or ten Foot wide, according as you desire it in Bigness, built up with Brick or Stone, with a door-place at one side: In the midst of the Room, on the Floor, must the Fire-place be made, about thirteen Inches wide within, and thirteen Inches high in length, from the Mouth thereof almost to the back-part of the Kiln, leaving only a way for a Man



Man to go round the End of it. It is usually called a Horfe, as is commonly made in Malt-kilns, the Fire passing out at Holes on each side, and at the End thereof; every Mason or Brick-layer almost knowing how to make it.

About five Foot high is placed the Bed or Floor whereon the Hops lie to be dried, which must have a Wall about it four Foot high to keep the Hops up from falling. At the one side of the upper Bed must be made a Window to shove off the dried Hops down into the Room prepared for them. The Beds must be made of Laths or Rails sawn very even, an Inch square, and laid a quarter of an Inch asunder, with a cross-beam to support them in the middle, into which Beam the Laths are to be let in even with the top of it, which will keep the Laths even in their places. On this Bed, without any Oost-cloth, lay your Hops by Basket-fulls, beginning at the one end, and so proceeding 'till all be covered over half a Yard thick without treading on them; then lay them even with a Rake or Stick, that they may not lie thicker in one place than another; and then make your Fire below of broken Poles, or other Wood, say some; but Charcoal is the only Fuel for Hops. You must keep your Fire at a constant Heat, and only at the Mouth of the Furnace; for the Air will disperse it sufficiently. The Hops this way are not to be stirred until they are thoroughly dried, which is not until the Tops are dry as well as the Bottom; but if any place be not so dry as the rest (which you may perceive by reaching over them with a Stick or Wand, and touching of them in several places) observe where they rattle; and where not, abate them there, and dispose of them where the places were first dry. When they are through dry (which is known by the Brittleness of the inner Stalk if rubbed and it break short) then are they  
 enough;

enough; at which time take out the Fire, and shove out the Hops at the Window for that purpose, with a Coal-rake made of a Board at the end of a Pole, into the Room made to receive them, and go in at the Door below, and sweep together the Seeds, and Hops, that fell through, and lay them with the other; and then proceed to lay another Bed of green Hops as before, and renew the Fire.

In several places they dry their Hops on the ordinary Malt-kilns on a Hair-cloth, laying of them about six Inches thick; and when they are almost dry, with a Scoop, made for that purpose, they turn them upside down, and let them lie again 'till every Hop, as near as they can, be thoroughly dried: And then with the Hair-cloth remove them to the Heap; where they are to lie 'till they be bagged, Both these ways are subject to several Inconveniences. In the first way, the Hops lying so thick, and never turned, the Under-part of them must needs be dry before the Upper; and the Fire passing through the whole Bed to dry the uppermost Hops, must needs over-dry and much injure the greater part of the Hops both in strength and weight, besides the waste of Firing, which must be long continued to thorough-dry so many together.

*Another way to dry Hops.*

In the second way, the turning of the Hops breaks them very much, by forcing of the Scoop amongst them, the rough Hair-cloth frets and spoils many of the Hops, and shatters their Seed; else this way is rather to be preferred before the other.

Which several Inconveniences may be prevented by making the Lower-part of the Kiln as before is described, and the Bed thereof made after the following manner. First make a Bed of flat Ledges about an Inch thick, and two or three Inches broad saw'd, and laid a-cross one another Chequer-wise the flat way, the Distance to be about three or four Inches; the Edges so entred the one into the other,

that

*Best way of drying Hops.*

that the Floor may be even and smooth: This Bed may rest on two or three Joists, set edge-wise to support it from sinking.

Then cover this Bed with large double Tin solder'd together at each Joint, and so order the Ledges before you lay them, that the Joints of the Tin may always lie over the middle of the Ledge; and when the Bed is wholly covered with Tin, fit Boards about the Edges of the Kiln to keep up the Hops; only let one side be to remove, that the Hops may be shoved off as before.

On this Tin-floor or Bed may the Hops be turned without such hazard or loss as before on the Hair, and with less expence of Fuel; also any manner of Fuel will serve for this purpose as well as Charcoal, the Smoak not passing through the Hops as in either of the other ways: But you must remember to make Conveyances for it at the several Corners and Sides of your Kiln. The saving of Fuel only, besides the advantage your Hops receive, will of it self, in a little time, recompence the extraordinary charge of a Tin-floor.

The turning of Hops, after the most facil and best way, is found to be not only a waste and an injury to the Hops, but also an expence of Fuel and Time; because they require as much Fuel and as long time to dry a small part when they are turned, as if they were almost all to be dried; which may be prevented, in case the upper Bed whereon the Hops lie have a Cover, that may be let down and raised at pleasure: Which Cover may be tinned over, only by nailing of single Tin-plates over the face of it, that when the Hops begin to dry, and are ready to turn, that is, that the greatest part of the Moisture is evaporated away; then may you let down the Cover within a Foot or less of the Hops, which (reverberatory-like) will reflect the heat upon them, that the uppermost Hop will soon be

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as dry as the lower, and every Hop equally dried. This is the most expeditious, sure, and least expensive way of drying of Hops, and the costliest and troublesomest part of the Work that belongs to them.

As soon as your Hops are off the Kiln, lay them *Bagging of Hops.* in some Room three or four Weeks or more, that they may cool, give, and toughen; for if they are immediately bagged, they will break to Powder; but if they lie a while (the longer the better, if they be close covered from the Air with Blankets) you may bag them with the more security.

The Manner whereof is usually thus: Make a hole round or square in an upper Floor, big enough that a Man may with ease go up and down, and turn and wind in it: Then tack on a Hoop about the Mouth of the Bag fast with Pack-thread, that it may bear the weight of the Hops when full, and of the Man that treads them; then let the Bag down through the Hole, and the Hoop will rest above, and keep the Bag from sliding wholly through, into which Bag cast a few Hops, and before you go in to tread, tie at each lower Corner a handful of Hops with a piece of Pack-thread to make as it were a Tassel by which you may conveniently lift or remove the Bag when full; then go into the Bag, and tread the Hops on every side, another still casting in as fast as you require them, 'till it be full: When it is well trodden and filled, let down the Bag by unripping of the Hoop, and close the Mouth of the Bag, filling of the two uppermost Corners as you did the two lower; which Bag, if well dried and well packed, you may keep in a dry place several Years; only you must have a care that the Mice do not spoil or destroy them; not that they will eat them, but make their Nests in them.

In *Hampshire* they sell Water-Trefoil as dear as Hops, and say that it doth upon all accounts as  
L well,

well, and that an eighth part of the Quantity of it as of Hops will do. 'Tis a very wholesome Herb, and esteemed very good for the Scurvy.

After you have laid by your Hops, you may return again to the Hop-garden to take care of your Poles for another Year. Strip off the Hawm first from them, and set up three Poles (like unto a Triangle wherewith they usually weigh heavy Ware) spreading at the Bottom, and bound together near the Top, about which you may set as many of your Poles as you please; bind them about with a little Hawm twisted to keep them together: By this means the outward Poles are only subject to the Injuries of the Weather, keeping all the inner Poles dry, except only at the Tops: And therefore some lay them on Heaps, and cover them with Hawm: But the best way is, to house them in your Shed, which may serve to preserve them in, and to gather your Hops into.

*Manure.*

In Winter, when little else can be done to the Hop-garden, you may then provide your Soil, and Manure against the Spring. If the Dung you carry in be rotten, mix it with two or three parts of common Earth, and so let it lie well mixed 'till you have occasion to make up your Hills. But if your Dung be new, then let it lie mixed 'till another Year; for new Dung is very injurious to Hops.

Horse-dung or Cow-dung is very good; but no Dung can compare with Pigeons-dung, a little whereof laid to a Hill, and mixed that it may not be too hot in a place, is of great advantage. Sheeps-dung is also very good. And if in Spring or Summer-time you steep Sheeps-dung, Pigeons-dung, or Hens-dung, in Water, 'till it be quite dissolved; and if when you water your Hops, on the Top of every Hill, in the hollow place made to contain Water, you put a Dish-full of this dissolved Dung, it will prove a most expeditious way, and the least  
 expen-

expensive of any, to enrich your Hop-hills. Also by this means you may convey to the Roots of Hops, or any other Plants, the fixed Salt of Urine, of Lime, Ashes, or any other fertilizing Subject whatsoever.

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Chap. XXI. *French Furze.*

**T**hey make very great Improvement of their sandy, gravelly Land in *Devonshire* and *Cornwal*, where Fuel is very scarce, by sowing of them with *French Furze* Seed, which they reckon a great Improver of their Land, and a Fitter of it for Corn. Upon some Lands they will grow to be fourteen or fifteen Foot high, and afford very great Quantities of Fuel. But I must refer a more particular Account of this to the Appendix.

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Chap. XXII. *Of Carrots.*

**C***arrots*, tho' Garden-Roots, yet they do well in the Fields for Seed, tho' the Land for them should rather be digged than plowed; but if it is plowed, it should be very deep, because they extend their Root much downward. They delight in a deep, rich, warm, black Garden-Mould, rather inclining to Sand than Clay.

The time of sowing them is about the beginning or middle of *March*. They should be well covered and hoed, 'till they get above the Weeds. The Roots are good for Hogs and Geese; but the best Profit of them is the Seed, which near great Cities sells for a great Price. At *London* it commonly yields from five Pounds to ten or twelve Pounds per Hundred.



I heard of a Man in *Essex* that had an old Orchard of about an Acre of Ground that was a very rich Mould; he stubbed up all the Trees, and dug it up, and sowed it with Carrots, which he let run to Seed, and had of it ten hundred Weight, which he sold that Year for ten Pound *per* hundred.

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### Chap. XXIII. Of *Teasils*.

**I**N some Parts of *Essex* they sow their Lands with *Teasils* to dress their Bays and Cloth with; which they do upon Lands already plowed up for Corn: And about *December* they either double furrow it, that is, have one Plough to follow the other in the same Furrow, or dig it up; and the latter End of *February*, or the Beginning of *March*, they sow the *Teasil*-seed, which they keep well weeded in Spring. One Peck will sow an Acre. They esteem a Clay-ground the best Soil for them. They cut them about *August*, tying them up in Bundles, or Staves, as they call it, and set them to dry in the Sun if the Weather be fair; but if not, they set them in Rooms and dry them there. The common Produce is about one hundred and sixty Bundles or Staves upon an Acre, which they sell for about one Shilling a Stave. But the most common way of propagating them is, to sow them mixed with Caraway and Coriander-seed, of which there is a great deal sown about *Kelvedon*, *Coggeshall*, and other places in *Essex*.

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### Chap. XXIV. Of *Caraway* and *Coriander*-Seed.

**C***araway*-seed delights in a dry Mould something inclining to Clay, or rich Garden-Mould, which they sow about the latter End of *February*,  
or

or beginning of *March*. Eight pounds will sow an Acre, with which they commonly mix eight pounds of *Coriander-feed*, and sometimes about half a Peck of *Teasils*, both which yield their Crop the first Year; whereas the *Caraway-feed* is the second Year before 'tis fit to cut, but then it will last three or four Years, for which they order the Ground as for *Teasils*, and keep the Land hoed twice a Year, once in Spring, and in *August*, which costs them ten or twelve Shillings an Acre to do.

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Chap. XXV. *Of Aniseed.*

**A** *Nise* may be propagated in *England* if sown in *February*, for which the Ground should be prepared about *Michaelmas*, and some new Horse-dung strewed upon it to preserve it from the Frost. They will be ripe about *Bartholomew-tide*, when they may be sown again for next Year. It is best to renew them every two Years. The Leaves hereof are used in Sallet, and have a very pleasant Taste; but they must not be too much, nor too frequently, used with hot Food, but with Fish they may securely, and the bad Qualities thereof may be allay'd by mixing of Parsly, Bete, and Burrage or Lettice therewith. They also may be sown for good Profit for Merchandise.

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BOOK VI.

Chap. I. *Of several Sorts of Beasts, Fowls, and Insects, for the Stocking of Land.*

**A**S the Farm is of little use unless it be stocked with Beasts, or other Animals, that may be employed in the Labour and Work  
L 3 of

of it, and for the Supply of the Market and Kitchen : So the Farmer is to consider what will turn to the best Advantage, and what is most proper and suitable to his Land, for the Uses he intends to employ it for, and the Cost and Charges of such a Stock ; that so he may suit his Undertaking to his Purse. The common reckoning for stocking of a Farm is three Years Rent ; as, that three hundred Pounds will stock a Farm of one hundred Pounds *per Ann.* which is commonly near about what is sufficient, except in very dear Years : Concerning which sort of useful Stock, I shall first begin with the *Horse*, as one of the most noble, strongest, swiftest, and most necessary of all the Beasts used in a Farm.

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## Chap. II. *Of Horses and Mares.*

**W**Here you have good store of Pasture, either in several or common, or in Woods or Groves ; it's no small Advantage to keep a Team of Mares for Breed : But where there is most Arable, and little Pasture-Land, Stone-Horses or Geldings, are more necessary, as may be observed in several Counties of that sort. In *Hertfordshire* they make great advantage by buying of Colts out of *Leicestershire*, of between two and three Years old, which at about six Years old they sell to Gentlemen at *London* for their Coaches. These Colts improve much in their Stature, and their Work pays for their keeping ; which makes it a double Advantage to them, and gives the Farmer opportunity of bringing them up to be fit for business.

If you design to have beautiful strong Colts, let your Stallion and Mare be so, especially your Mares ; for the Form and Shape of the Foal is most commonly more like to the Mare than the Horse, and more particularly for the Head and Neck, which



which is the beautiful part of the Horse: Let both the Stallion and Mare be of lively, brisk Natures; for heavy, dull Breeders will always produce lumpy, heavy Colts: And see that they be of healthy sound Constitutions; for your Colts will for the most part have the same Distempers with the Stallions and Mares: And if you desire to have large Colts, be sure to have large-bellied Mares, that the Colts may have room to grow in, and give them good keeping, and then you need not fear their Size, let the Stallion be of what Stature he will.

Make your Mares as tame as you can: It's better to keep them to gentle, easie Work, such as plowing an hour or two in a day, &c. than to have them wild; for by being acquainted with their Keeper, and being soberly handled, you may with ease remove them from one Pasture to another, bring them to be covered, and to take their Colts from them: Whereas wild Mares are not only troublesome, but often destroy their Colts in their Bellies, by their wild leaping of Ditches and Hedges, &c. And the same care ought to be taken with Colts to make them tame, who are often apt else to do themselves a mischief, whenever you have occasion to do any thing with them.

The surest way of having your Mares breed, and the most profitable for the Farmer, except he keeps his Stallion to let out to hire, is to have a place well fenced, that is good Land to keep your Horse in, and to let your Mares go with your Horse during the Months of *April* and *May*: But your Horse this way will not serve so many Mares as if housed, nor be so fit for constant working the other ten Months of the Year: And therefore if you work him hard, and let him out to horse more Mares than your own, you must take him into the Stable, and feed him well; and if the Horse is kept in the Stable, it is reckoned best to take the Mare in too

for about a Month or six Weeks, and that she be fed well with Hay and Oats, and that about five or six days before you bring her to the Horse, you let her blood on both sides of the Neck, taking about a quart of Blood out of each Vein.

As to the Manner of covering of the Mares, they have in the breeding Countries, in the house where they keep Stallions on purpose to let out to horse Mares, a square hole with a door to it, big enough for the Horse to put his Head and Neck out at; to which hole they bring the Mare for the Horse to smell on, by which means they can see whether the Mare will stand to the Horse or not, without any danger of the Mare's striking the Horse, or his doing of himself any injury. If they find the Mare willing to stand, they have her out into some broad place, where they lead the Stallion out to her; and if he be unlucky and mad, with two Men to lead him, and let him horse her: They reckon in the Morning fasting, or in the Evening, the best times of the Day; especially the Morning, and that the Horse be well provender'd, and drink but little over Night. When the Stallion is dismounted, they commonly throw a Pail of cold Water on the Mare, which they think makes her stand the better to her horsing.

After she is covered, they that are very exact in taking care of them, keep them to the same Diet as before for three Weeks or a Month, and without Work, and about *September* they take their Mares into the House again, where they keep them 'till they foal; at which time they feed them with Mashies and other moist Food 'till Grass comes to be plenty: Which are Niceties the Farmer seldom troubles himself about. If after they have foaled they keep them a Night or two in the Stable, and give them the best Hay, Grass, and Oats that they have, they think it sufficient.

The

The best Age to breed at, is when the Mares are from four to twelve Years old, and much longer if the Mares have only been kept to breed on, and not wrought; and the Horse from five to fourteen Years old. I shall not mention any thing of the time of the Moon, nor about the several ways mentioned for the procuring of Horse or Mare Foals; because I could never find them effectual, or any ways significant.

Let your breeding Mares, fourteen or fifteen days before their foaling, be well kept; which will not only make her have plenty of Milk, but cause her quickly to take horse again: The best time for which is about twenty days after her foaling.

The best times for the weaning of Colts is at *Candlemas* or *Shrove-tide*: In this respect you must be very careful; for if your Colts be not well weaned, well summered and wintered, especially for the first three Years, they will seldom prove either good or large: Be sure, for the first Summer, to keep them out of the hearing of the Dam.

When the Colts are about two Years old, it is the best time to take them up, and to make them tame; and the Year following, when they are three Years old, back them that are to be for the Saddle, only they must be used kindly at that Age. The first Year Saddle-Colts should only be walked, and the second but seldom trotted, and that but for a little way: But we cannot in *England* get upon a young Horse's Back without spoiling of him: And for those Horses that are for Draughts, I never knew any good Drawers, and gentle, that were broke after that Age; nor can I think but that easie, gentle Work is good for young Horses, to use them to it by degrees: But I would not have a Draught-Horse, that I were desirous of being very curious about, wrought above one hour, nor a Saddle-Horse galloped, nor rid above ten Miles in a Day, 'till they are seven Years old. If



If your Colts be any ways unruly or wild at the first coming into the House, let them have no Meat but what they take out of their Keeper's hand; by which means you will make them gentle without any Violence: If that will not do, keep them waking, and want of Sleep will cure the wildest Horse that is. But to prevent his being so, use him from his Foaling to be fed in Winter at hand in the House; and for some time when you back him first, never ride him but with a Horse before him, and always in the Company of as many Horses as you can.

Whoever will keep his Horse bridled and saddled some time after his riding of a Journey, and let him champ on the Bit 'till he is in good temper, and takes not off his Saddle 'till he is cold, and then rubs the Saddle-place well, and doth not give him Water when hot, nor ride him hard at first setting out when he is full, and that takes care to ride him softly for the last Mile or two before he comes to his Journey's end, will be sure not to have either a sick or lame Horse.

But the most occasion that Farmers have being for Draught-Horses, I shall recommend to them the Choice of such as are strong, well limbed, and as near as can be, such as are of a height; for Horses in a Draught unequally suited, never draw at ease: And if they are well wrought, let them be well kept, and then you may expect business from them. A good Team of Horses cannot well have a less Allowance than forty Quarters of Oats in a Year, besides good Hay and good Grass when they are out of the House. It will likewise be necessary that the Farmer suit his Horses to his Ground as well as his other Cattle; so as that where his Land is rich he have the larger, and where barren the smaller Sort of Horses, except he keep Stone-Horses, and keep them always at Hay and Oats.

Fifty

Fifty Acres of Fallow-Land, is as much work as can well be managed by a Team of five Horses ; if it is stiff Land, they must be very stout Horses, or that Quantity will be too much for them.

There are several Epidemical Distempers destructive to the Farmer's Stock: And though there are many Pretenders to the Art of Farriering and Cow-leeching, yet many of them are very ignorant, especially in the Countries, the Books that are writ upon that Subject being chiefly Collections from others, with a very small Number of experienced Receipts amongst them, so that but few can tell, out of so great a Number, which to chuse, unless they had opportunities of trying all of them, which would be a very expensive way of Knowledge to the Farmer. I have thought it might be of use to publish some Receipts that I have had the Experience of my self, or have from them that have experienced them, which I think I can depend upon, because they have not been such as have had any Advantage by it: Which, though they are but a small Number, yet if by the communicating of them I can, for the publick Good, perswade others that have any experienced Receipts, to communicate them too, and to send them to the Publisher hereof, that they may be inserted in my *Appendix*; it will, I think, be a Work that will be of great Advantage not only to the Farmer, but even to the Professors and Practisers of these Arts too: And therefore I shall begin with some Observations concerning the Purging of Horses; in doing of which, I shall consider two things: First, the Doses, which are to be proportioned according to the Size and Strength of the Horse; and secondly, give some Directions for the ordering of a Horse, when he takes a Purge.

§. 1. *Of Purging a Horse.*

Take Horse-Aloes beaten to fine Powder, one Ounce; two Ounces of fresh Butter; and add a small Quantity of Powder of Aniseeds, for a Horse of thirteen Hands high.

Take Aloes one Ounce and a quarter, if a great feeding Horse; if not, one Ounce and half a quarter, with three Ounces of Butter, and two Ounces of Aniseeds, for a Horse of fourteen Hands high.

Take Aloes one Ounce and a half if a great Feeder; if not, an Ounce and a quarter, and half a quarter, and something better: Then two Ounces of Powder of Aniseeds, with the same Quantity of Butter, for a Horse of fifteen Hands high.

Make these several Quantities into Balls of about the Bigness of a small Wash-ball; and after you have given two of them, give the Horse a Horn-full of strong or small Beer, and another Horn-full after you have given the rest of the Balls, which should be anointed with a little Butter.

The day before you purge your Horse give him warm Water with Bran in it, and the next Morning fasting give him the Purge: Ride him a quarter of an Hour, bring him in, and let him stand two Hours without eating; then give him some Hay, and an Hour after, water him with warm Water; and an Hour after that give him scalded Bran: Do the same at Night, and next Morning: If he purges, ride him out a little; and then bring him in, and give him scalded Bran; a while after water, and ride him out again while he purges; then bring him in and give him scalded Bran; a while after water, and ride him out again while he purges; then bring him in, and give him scalded Bran.



Bran. Thus you may make it work more or less as you please, by repeating the giving of him Water and Riding. Over-night give him very little Hay; for it is best taking any Physick on an empty Stomach.

Note, that if your Horse is newly taken up from Grass, great care must be taken of him, and he must stand in the House at least a Week or ten Days before you purge him; and be sure give such a Horse scalded Bran, as is before directed. I have known several Horses killed for want of observing this Rule.

§. 2. *Another Purge.*

Take Aloes Succotrinæ an Ounce, Treacle an Ounce, Venice Turpentine an Ounce, Sena beaten an Ounce, Honey half a Pound: Mingle these together in a Pint of White-wine or Sack, and give it lukewarm for a Horse of fourteen Hands.

§. 3. *Another Purge.*

Take Aloes an Ounce, Jalap, Cream of Tartar, and Sena, of each a Drachm and a half, if the Horse be fourteen Hands, (if fifteen Hands, add half a Drachm more of each) of Aniseeds half an Ounce: Make it up with a little Butter into Balls as big as a Walnut.

§. 4. *To Purge Grease, for a middle-sized Horse. [†]*

Take fresh Butter four Ounces, Castile Soap two Ounces, Hempseed in Powder two Spoonfuls, Sugar-candy an Ounce: Make it into Balls and give it, riding him after it, and let him have his Water warm'd the first time you water him.

§. 5. *If*

*§. 5. If a Purge work too much, how to stop it.*

Take Bole-Armoniack two Ounces, a bit of Whiting as big as a Pullet's Egg; beat it fine, and boil it in three Pints of Beer, with two or three Slices of brown Bread in it, and sweeten it with Sugar.

The best time to bleed, if you design purging of a Horse, is about ten Days after his Purging.

*§. 6. For a foundred Horse.*

Take an Egg, break it, and put it into a Horse's Foot, and keep it in by putting a Piece of Leather over it, which you may fasten with Splints put cross under the Shooe: Let him stand so all Night, or twenty four Hours, and it will for a Day or two, as I am told from very good Hands, make him go easie, and take away the Pain.

For *Surbating*, which is the beating of the Horses Hoof against the Ground; use the same Medicine as above, or some fresh Butter.

*§. 7. For Coughs or Colds.*

Take a Quart of Ale, half an Ounce of Diapente, half an Ounce of Bay-berries bruised small, Grains of Paradise pounded an Ounce, Horse-spice two Ounces; let it boil, and no more, adding to it two Spoonfuls of Sallet-oil, and two of Honey.

When you give any of these opening Drinks, give it to the Horse in the Morning fasting, and ride him half an Hour after it, and tye him up three Hours to the Rack; after which give him a Mash and warm Water at Night, and next Day in the Morning. If he goes to Grass, take him up a Night or two before-hand, and let him stand in two Nights after the taking of it; and when you turn

turn him out, let it be in a warm Day, taking of him up two or three Nights more.

§. 8. *For an ordinary Cold.*

Take a small Piece of Rag dipt in Tar mix'd with a little Honey, and tye it about his Bit ; ride him upon it, and set him up warm.

§. 9. *For a Grass-Cold.*

Take up your Horse early in the Morning, give him a Pint of Ale lukewarm ; dissolve in it half an Ounce of the Juice of Liquorice, ride him half an Hour softly, so as not to heat him at all, and turn him out presently.

§. 10. *Balls for a Cold, Consumption, or any inward Distemper.*

Take Wheat-meal six Pounds, Aniseeds two Ounces, Cummin-seeds six Drachms, Carthamus one Drachm and a half, Fenugreek-seeds one Ounce and two Drachms, Brimstone one Ounce and a half, Liquorice six Ounces, Elecampane three Ounces, Bay-berries and Juniper-berries of each an Ounce and half, Sallet-oil one Pint, Honey one Pint and half, the Yolks of six Eggs, White-wine four Pints: All being finely powder'd, make them into Paste, of which make Balls as big as a Man's Fist, and give the Horse a Ball dissolved in his Water, Morning and Evening, for fifteen Days together : If he refuse it at first, he will quickly desire it if kept to it.

§. 11. *Of the Plague, Gargle, or Murrain in a Horse.*

The Murrain is principally caused from a hot, dry Season of the Year, or rather from some general



ral Putrefaction of the Air, or from the Infection of other Cattle, from Cattle smelling to Carrion, and licking of the Bones; from foul Food, as overflown Hay, Grass rotted by the long standing of Water on it in wet Summers; which Sort of Food is much better to rot on the Ground than to be made use of. All these things beget an Inflammation in the Blood, and cause a swelling in the Throat, which in little time suffocateth the Cattle.

The Signs of this Disease are, a hanging down of the Head, Gum at the Eyes as big as your Finger, going weakly, staggering, the Head swelling very big, the Breath short, the Heart beating, with rattling in the Throat: And if you put your Hand into his Mouth, and find his Breath very hot, his Tongue shining, he hath the Distemper very strong. If he be taken backward, he will be very stiff, and his Guts rumble very much.

If any of your Cattle are infected, speedily let both sick and well Blood, and drench them. The following Receipt I have not had opportunity to try, but it hath been much recommended to me.

Take Diapente a Quarter of an Ounce, Dialthæa, London Treacle, Mithridate, and Rhubarb, of each the Quantity of a Nut; of Saffron a small Quantity, Wormwood, red Sage, of each an handful, and two Cloves of Garlick: Boil all together in two Pints of Beer, 'till it comes to a Pint and a half; give it lukewarm, when he is fasting: Keep him very warm, and give him a Mash of Ground-Malt; let him drink warm Water for a Week, and sometimes have boiled Oats. If you can make him sweat he will do well: If one Drink will not do, give him another three Days after. Half the Proportion will do for a Cow.

§. 12. *For*

§. 12. *For the Colick, Belly-ach, or Gripes.*

This proceeds from a fretting, gnawing, or swelling of the Belly, occasioned from windy Humours, or from eating of green Corn, or Pulse.

It is known by a Horse's stretching his Neck, Legs, or Belly, by his lying down and rising often, stamping with his Feet: He will rather look full than empty: And if he is cold in the Mouth, he is in great danger.

Take half a Pint of White-wine, warm it, and put to it six Ounces of Oil, and fifty Drops of Spirit of Harts-horn; give it the Horse: But if he is full of Blood, let him bleed first. If the said Dose will not do, give him another; into which you may put a hundred Drops of the Spirit of Harts-horn.

Take Aqua-vitæ four Ounces, two Nutmegs grated, Saffron two Drachms, Sallet-oil six Spoonfuls; give it the Horse, ride him after it, and set him up warm.

§. 13. *For Grease and Swollen Heels.*

If your Horse's Legs swell in the Stable, give him some Powder of Brimstone in his Oats, and it will make his Coat lie fine, and do him good for his Heels: But if his Legs swell much, use the following Receipt.

Take Soap and Hog's Lard, of each a like Quantity; boil it, and put some Turpentine into it a little before it comes off the Fire: Cut away the Hair, and spread a Plaster on Flax, and apply it twice a Day, 'till it runs vehemently; and give him the Purge at Page 157, where you will find this Mark [†]. You may likewise rowel him in the Chest.

§. 14. *For the Staggers or Stavers.*

The Staggers is a Giddiness in a Horse's Brain, which turns to Madness. It is caused sometimes by corrupt Blood or gross tough Humours oppressing the Brain : And sometimes by turning of a Horse out to grass before he is cold, and by hard Labour. The Signs of it are Dimness of Sight, Reeling, and Staggering of the Horse, who for very pain will beat his Head against the Wall, and thrust it into his Litter, forsake his Meat, and have waterish Eyes.

First let him Blood in his hinder Parts, to draw the Blood from his Head ; and about the middle of his Forehead cut a slit thro' the Skin about half an Inch long ; upon this clap a Plaster of Pitch : If it run, the Horse will do well again ; if not, he will dye. Before you lay on the Plaster, take a bit of the middle-part of a Dock-root, and thrust into the hole of the slit, between the Skin and the Bone, up the upper-part of the slit, and lay the Plaster on it, which renew as you see occasion.

§. 15. *For a Mallender.*

Take Bay-salt, Gun-powder and Hog's Lard, mix it together, and anoint the place once in two or three Days ; you may add a Pennyworth of *Unguentum Apostolorum* to it.

§. 16. *For Sore-Eyes.*

Where a Skin is growing over the Eyes, take an Egg, break off the top, take out the Yolk, and to the White add a little fine powdered Salt, and set the Egg on the Fire, 'till it come to a Powder, which mix with a little Honey, and put it into the Horse's  
Eye



Eye with a Feather : But if you find it not sharp enough to eat off the Skin ; then blow the Powder alone in with a Quill.

Hobgoblin's Claws scraped to Powder, and put into a Quill, and blown into a Man's, Horse's, or Beast's Eye, is an extraordinary thing. You may have it at most Apothecaries in *London*.

If a great Rheum follow the Eye, lay round it the defensative Plaster, which may be had at any Apothecary's. It's good to drive Humours from any Wound.

§. 17. *For a blow on the Eye.*

Take some Honey, and add a small Quantity of Powder of Ginger unto it, and put it into the Horse's Eye, or take some Hog's Lard, Oil of Roses, Oil of Elder, of each a like Quantity, melt it together, and anoint the Horse's Eye with it.

§. 18. *To draw out a Thorn.*

Take two Whites of Eggs, add to them some Wheat-flower and Vinegar, and tie it on with a Cloth.

§. 19. *To prevent a Mare's sinking her Foal.*

Be sure to take care of her in snowy Weather, and keep her where she may have good Spring-Water to drink, and not drink the melted Snow ; which is very prejudicial to her.

§. 20. *For Gravel, or a Nail run into a Horse's Foot.*

Search it so as to lay it open, and pour into it Tallow boiling hot.

Chap. III. *Of Asses.*

**T**HE *Ass*, tho' a contemptible Creature, is very serviceable to many that are not able to buy or keep a Horse; especially where they live near to any Heaths or Commons, the barrenest of which will keep him, he being contented with any trash; as dry Leaves, Stalks, Thistles, Bryers, Chaff, and any Sort of Straw is excellent Food for him; he needs very little looking to, and will sustain Labour, Hunger and Thirst, beyond most Creatures, and is seldom or never sick; and of all other Cattle he endureth the longest. They may be made use of to plow light Lands, to carry burdens, to draw in Mills, for which they are very excellent, to fetch Water, or any other odd things. They are very useful for their Milk, which is an excellent restorative in Consumptions and other Weaknesses: But they would be of much more advantage, were they used, as they are in foreign Parts, for the breeding of Mules, as I shall shew in the next Chapter.

The She-*Asses*, when you have any regard to their breed, should be cover'd between the Months of *March* and *June*. The best Age to breed on them, is from three Years old to ten, and you should let the young *Asses* suck two Years, and not work them 'till they are three Years old.

Those are reckoned the best shaped that are well squared, have large Eyes, wide Nostrils, long Necks, broad Breasts, high Shoulders, a great Back, short Tail, the Hair sleek, and of a blackish Colour; their Skins make the most durable Shooes of any Sort of Leather whatever.

But I suppose the great Impediments of the keeping them, are the Injuries that they do to Trees, which they are very mischievous to; and their slowness;

slowness; but that hath a Conveniency in it, in that it is what makes them able to endure so great Labour and Hardship.

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Chap. IV. *Of Mules.*

**M***U*les are chiefly used in the rocky Countries, where are stony and rocky Ways, as on the *Alps*, the *Pyrenean* Mountains, &c. where great Numbers of them are kept; so as that upon the Roads, you may see forty or fifty of them together, most of them coal-black, that are very finely shap'd, and very large, being bred of the fine *Spanish* Mares, which are some of the handsomest Sort of Mares that are; and the Mules are as fine, many of them being sixteen or seventeen Hands high, and valu'd at forty or fifty Pounds a piece: They are the best Sort of Creatures that are for Burden and Sure-footedness, especially in stony ways; and are excellent for draught, and the greatness of their strength: An Instance of which I saw in one that my Father had which was bred in *England*, that was for shape a very thick short one, and for height about fourteen Hands and an half: This Mule being put in the Fill of a Cart, at the bottom of which was slung a very great Piece of Timber, so big, that because it was to be drawn up a steep Hill, the Carters and some other Countrymen present, concluded that the Mule and four Stone-horses more could not draw it up; and while they were busie about the tying of it, and doing some other things to the Cart, they not minding to hold the Mule, or to take any care of him, he alone run away with the Cart, and Timber, half way up the steepest Part of the Hill, before they could stop him: And I saw in *London* two Mules that were Sumpter-Mules to a Colonel in *Flanders*, bred there of the large *Flan-*



*ders* Mares ; one of them was sixteen Hands and an half high, and the other seventeen and an half, and they were as big set as any of the Dray or Cart-horses used in *London* : And several of the Soldiers did affirm, that they had travelled for several Months together with eight hundred Weight a piece on their Backs. Which makes me wonder that they are not more minded in *England*, than they are ; especially considering their Hardiness, and freedom from Distempers, and the length of their Lives, which is almost double to that of Horses. In which particular those bred in the cold Countries far exceed them that are bred in the hot ; they go easier, and are much better to ride than Horses for their Walk and Trot ; but they are commonly rough Gallopers, tho' some of them are very fleet that are long made : Their shape for nimbleness, strength, and bigness, being much according to the Proportion of the Mare you bred them on, and so they may be suited for what use you design them. The greatest Inconvenience that attends them is, that many of them are apt to kick and be stomachful : But it is commonly the not taking due care of them while they are young ; They being of little value amongst us, makes People neglect them ; else those bred beyond Sea, are as gentle as either Horses or Mares.

Mules are of two Sorts ; the one between the Horse and the She-Ass, and the other between the He-Ass and the Mare : The first Sort are commonly very dull, and partake too much of the Ass, and are not so large : And therefore the latter Sort are much more used and propagated. For this Sort of Breed you must take care, to get one of the largest and finest He-Asses you can procure. In *Spain* they are so curious in their Breed of Mules, as to give fifty or sixty Pounds for a well-shaped, large He-Ass, only to make a Stallion of, and Breed of the finest, largest Mares they have, which they do by giving

giving to the As the advantage of the higher Ground, and by putting of the Mare into a narrow Pit railed on each side: And tho' the Mules are of both Sorts, yet being a mixed kind, they never breed, tho' some Authors affirm, that there are a Sort in *Syria* that procreate of their own kind.

If the As, you design to breed on, be suckled with a Mare, or the Mare suckled with an As, it makes them the more familiar, and the better acquainted with each kind; which you may bring either of them to do, by taking of the Colt that belongs to the Dam away from her, and by putting of the other Colt to her in the dark for ten Days or a Fortnights time.

## Chap. V. *Of the Bull, Cow, Calf, and Ox.*

**B**ULLS and Cows are very serviceable to the Husbandman for Work, and for the supply of the Family and Market. The best breed is reckon'd that of *Yorkshire, Derbyshire, Lancashire, Staffordshire, &c.* and a good hardy Sort for fattening on barren or midling Sort of Land are your *Angleseys* and *Welsh*. The hardiest are the *Scotch*; but the best Sort of Cows for the Pail, only they are tender and need very good keeping, are the long legged, short horn'd Cow of the *Dutch*-breed, which is to be had in some places of *Lincolnshire*, but most used in *Kent*; many of these Cows will give two Gallons of Milk at a Meal: But in furnishing of your self with Cattle, you ought to consider the Goodness of your Land, and the Use you design your Cattle for, as whether for Breed, Milk or Work.

If for Breed, the better your Land is, the larger may your Kine be; and the cheaper, the more will be your profit: Only observe, that of what Kind soever your Breed is, that it be the best of the Sort,

and let your Bull be of the same Country with your Cow, for they reckon a mixed Breed not so good.

For the shape of your *Bull*, he should be one of a sharp quick Countenance, his Forehead broad and curled, his Eyes black and large, his Horns long, his Neck fleshy, his Belly long and large, his Hair smooth like Velvet, his Breast big, his Back straight and flat, his Buttocks square, his Thighs round, his Legs straight, and his Joints short; this Sort of Bull is the best for Breed, and makes the best Oxen for draught.

The *Cow* ought to have a broad Forehead, black Eyes, great clean Horns, her Neck long and thin, a large deep Belly, thick thighs, round Legs, short Joints, a white large deep Udder, having four Teats, and her Feet large. As for the size of your Cows, as of all other Cattle, it must be suited to the Goodness of your Land, tho' the largest commonly give the most Milk: And whether you design them for Breed, Fattening or Milk; let them be such as come off a worse Ground than your own as near as you can.

The Use of the Cow is either for the Dairy or Breed: The red Cow is reckoned to give the best Milk, and the black to bring the best Calves; but the Cow that giveth Milk longest, is esteemed the best, both for profit and breeding; and for them to Calve in *March* or *April* is the best time for the Dairy.

I shall not mention any thing about the making of Butter and Cheese, because most good House-wives are acquainted with the way of doing it; only as some Lands will make unsound Cheese, notwithstanding all the care the good House-wife can take, I shall here propose a remedy or two for that Inconveniency; which is, if you find any of your Cheese begin to be rotten, to cut it out, and scrape some Chalk into the hole so as to fill it up;



up; and to keep the Chalk from dropping out, spread some Butter over it, and it will prevent its going farther, by drying up the Moisture that causes it to corrupt: And to prevent the Mites breeding in Cheese, rub it over where you see them begin to breed, with Oil or Oak-ashes once in three Months, and it will kill them.

When a Cow is near calving, for about a Fortnight or three Weeks before, put her into good Grass; or if it be in Winter, give her Hay; and when she hath calved, that Day and Night keep her in the House, and let a little of the Cold be taken off the Water which you give her: Next Day about the Middle of the Day turn her out, if well, and well cleaned, and take her in two or three Nights more, giving her Water a little warm every Morning before you turn her out.

For Calves, there are two ways of breeding those that you design to rear; the one is to let them run with the Dam all the Year, which is the common way used in the cheap-breeding Countries, which they reckon makes the best Cattle; and the other way is to take them from the Dams after they have sucked about a Fortnight: Then they teach them to drink flet Milk, which they do but just warm for them, it being very dangerous to give it them too hot. The best time for weaning of Calves is from *January* to *May*. Let your Calves have Milk for about twelve Weeks; only a Fortnight before you wean them from Milk, let Water be mixed with the Milk; and after your Calf hath drank Milk about a Month, take some of the finest, sweetest Hay you have, and put little Wisps of it into some cleft Sticks, which place, so as the Calf may easily come at them for to learn him to eat; and after *Lady-day*, when the Weather is fair turn your Calves to Grass, taking them in a few Nights at first, giving them Milk and Water, and sometimes giving the same  
to



to them in a Pail in the Field, 'till you find they are able to feed of themselves as not to desire it: But by no means let your Grass be too rank, but short and sweet, that they may get it with some labour. All wean their Calves at Grass; for if you wean them in the House with Hay and Water, it is apt to make them big-belly'd and to rot; and when you have resolved which to keep of the Males for Bulls, let the others be gelt for Oxen, which the sooner you do, the better: When they are about ten or twenty Days old is the best time, and least dangerous.

In *Hertfordshire, Essex*, and most places near *London*, they commonly fat all their Calves for the Butcher, because they have there a good Market for them, and their Lands are not so profitable to breed on as in cheaper Countries; a good Calf there often selling for as much as a good Heifer, especially if they are very Fat and White, which they take a great deal of care to make them; their way of doing of which is by keeping of them clean, giving of them fresh Litter every day, which they lay upon their old Litter; for they clear out their Coops but two or three times in a Year, and most commonly at such a time as they have no Calves in them; they constantly also let them have a large Chalk-stone or two to lick, which they bore a hole through, and hang up by a string in a Corner of the Coop. They also observe to set their Coops where they may have as little Sun come on them as they can, that they be not made close and stifling, and that they stand a Yard above the Ground, that the Urine may run from them.

*Oxen.*

Of *Oxen*, the largest are esteemed the best for *Draught*, or for *Feeding*, (where there is Land able to bear them,) such being the strongest to endure Labour. For his Shape, it differeth little from that of the Bull; they that are the gentlest are the best

best for the Yoak. In matching of them, let them be as near as you can of one Height, Spirit, and Strength; else one will be apt to injure the other, and you must take care not to put them beyond their ordinary Pace, for heating of them puts them into Surfeits, and produces all Manner of Distempers in them.

The time of putting of Oxen to work is at three Years old, at which Age, for the first Year, work them very gently, especially in hot Weather, and feed them with a good deal of Hay, which will make them better able to endure their Labour, than Grass will; the keeping of them in a Middle-state, neither too fat, nor too lean, is best; they commonly work them 'till they are about ten or eleven Years old, and then sell them; let them always be used gently; for meat and fair words brings them sooner to the Yoak, than fear or blows: But the best way to rear up young ones, besides gentle Usage, is to couple them with an old gentle Ox; if they are unruly, let them be tyed with a Rope, and keep them hungry, that they may take meat often out of your Hand.

Oxen are much more profitable to keep, than Horses, there being no loss in them; if they prove either lame, or old; an old worked Ox fattening as well, and being as good Meat as a young one, and then their Feed is much cheaper, because they eat no Oats; and so is their Harness and Shooes: They are likewise not so subject to Diseases as Horses; but you must have a good bite of Grass and good Hay for them in Winter; only they are not so good for Draught where your ways are good, and that you have Occasion to cart much; but for Winter-plowing where you have a heavy Soil they will do as much as Horses, especially a sort of long legged nimble Ox, that they sell at *St. Ives* Fairs in *Huntingtonshire*, which will of any Work do almost as much as

as a Horse: Where any can keep two Teams, let it be in what place it will, I should choose to have one of my Teams, of Oxen. The yoking of Oxen together by the Necks and Breast, is much better than the doing of it by the Horns; and where a Man keeps an Oxe-Team, it is necessary, that he should rear two Oxen and two Cow-Calves every Year to uphold his Stock; for it is better for a Farmer as to all necessary things, that he be a Seller, than a Buyer.

Cattle are bought in to fat at Spring, and about *Michaelmas*; those you buy in at Spring, will be fat in *July*, *August*, or *September*, according as they are forward, and you have keeping for them; and those that you buy in *August*, *September*, or *October*, must be either to sell in Winter or in Spring, and must be forward in Flesh to be improved the beginning of Winter, and only kept up in Flesh during the hard time of Winter, either with Hay or Turneps, to be fit for a good Market whenever it offers; or they must be young, lean Cattle, that may by their growth pay for their Wintering, and so be ready to fat next Summer. Some upon ordinary Land buy in young Welch Heifers, which if they prove with Calf, they sell in Spring with a Calf by their side for the Dairy; and those that are not with Calf, they fat: All which ways turn to good account, according as the Prices fall out; but most commonly, all Meat either at *Christmas* or at Spring, is one third part dearer than in Summer: Because all have not the Conveniency either of Hay or Turneps to fat Cattle with in Winter; and it is but in few places, especially near *London*, (which is the chief Market for fat Cattle,) that Hay can be afforded to fat them with; for they reckon an Ox that cost about six Pound, will need about two Load of Hay to keep him up all Winter.

For



For the Wintering of Cattle; about *September*, you must turn them out that you design to keep up for a Winter, or a Spring-Market, and your Cows that give Milk into your Rowens, 'till Snow, or a hard Frost comes, and they will need no Fodder; but if Snow or Frost comes, you must give Hay to your Cows near calving, or those that have lately calved, or that give a great deal of Milk, and to your fattening Cattle, and that every Morning and Evening, which you must proportion according to the Quantity of Rowen or Tore that you have upon the Ground; the more Tore you have, the less Quantity of Hay will do, and even the sower Grass that your Cattle would not eat before, when the Frost hath taken it, will be good sweet Food for them, and what they will eat with pleasure, if it is not covered with Snow that they cannot come at it. But for your lean Cattle, and those that give but a little Milk, Straw will do well enough to fodder them with, only you must observe to give the Barley-straw first, and the Oat-straw last, except you value their Milk; if you do, give to such Cows your Oat-straw, if the Quantity of Milk that they give doth not deserve Hay, or that Hay is scarce with you; for Barley-straw will quite dry up that Milk that they have, tho' it is good Food for dry Cattle; but if your Hay fail you, to those Cows which you design to continue the Milk of, give Malt-dust, upon which pour scalding-hot Water, and it will cause it to swell mightily; let it stand 'till near cold, and give it to the Cow like a Mash, and it will cause her to give a great deal of Milk, tho' she eat Straw with it. A Bushel that costs but about Three-pence will serve a Cow a Week. But about *London* they give to their Cows in Winter, Grains, (of which they have plenty) which makes them give a great deal of Milk, but it is apt to rot them if given in too great Quantities,



rities, and for too long a time: But when your Tore is quite eaten up, which it will commonly be about *February*, you must house your Milch-Cows, that you give Hay to in your Cow-house all Night, and your other Cattle in your Yard; for which use you should have two Yards; one for your Cattle which eat Hay, and another for your Cattle which eat Straw, with Racks and other Conveniencies to fodder them in; observing that what you do give them, to do it often, and not to give them too much at a time; because when they have blown on it, they will not eat it; both your Yards ought to be well sheltred, and made as dry as you can, and a good deal of Straw given them to lie dry and warm in, which is a very great Advantage to them, and will much increase the Quantity of your Dung.

As to the Buying of fat Cattle, Milch-Cows, or lean Cattle, Experience and the Advice of those that understand them, is the best Instructor.

For the feeding of Land, you may do it with Beasts and Horses together, or with Beasts first, and Horses afterwards; and after both put in Sheep: But let not your Grass be too rank before you feed it; for if you do, it will be sowre, and your Cattle will not eat it, except only the Tops, and so the other part will lie untouched, and rot upon the Ground, for no Beast will eat sowre Grass 'till the Frost hath taken it. Observe also where you have Inclosures, to be often changing of your Cattle from one Pasture to another; for by that Means you will give your Land an opportunity of getting of a fresh Head, fresh Grass being a mighty help to the Feeding of Cattle.

As to the Distempers of these Sorts of Cattle, take these following Receipts.

§. 1. *For*

§. 1. *For the Garget, Plague or Murrain in Bulls, Cows, or Oxen. See p. 159.*

Most Authors confound these Distempers together; but whether they be the same, and only differ in the Degrees of the Malignity, I cannot determine; but commonly the same Remedies are proposed for both, tho' the Garget sometimes appears in the Head, and sometimes in the Maw, and sometimes in the Hinder-parts. When it lies in the Head, it is known by the Swelling of the Eye-lids, Blisters on the Tongue, &c. When in the Maw, by drooping and heaviness, panting of the Heart, hanging down of the Head, Costiveness of the Body, &c. And when behind he will be very stiff, and his Guts will rumble, &c.

If Blisters be on the Tongue take them off with a sharp Knife, and slit the Tongue underneath an Inch long, but not deep, and an infectious Water will come out, which wash with Vinegar. If it lie in the Maw, or behind, let Blood in the Neck-Vein; and for either of these Distempers give the following Drink, or that which is mentioned hereafter for the Murrain, which hath been recommended much to me by those that have often experienced them.

§. 2. *For the Gargle.*

Take Polypody of the Oak and Burdock-leaves, of each a handful; for want of the Leaves take the same Quantity of the Roots, shred them small, and put them into a Pint of Milk and boil them; let it cool, strain it, and give it the Cow.

For the Head-Gargle, give Powder of Fenu-greek, Turmerick, Liquorice, Aniseeds, of each an Ounce; of long Pepper half an Ounce, beat  
all

all to Powder; boil it in a Quart of Ale, giving of it Blood-warm.

§. 3. *For the Murrain.*

For the Signs of it see Page 158.

For the Cure

Take unslacked Lime, Coriander-seed, Marjoram and Garlick, beat all to Powder, and sprinkle it on Coals, letting the Fume of it go up the Beasts Nostrils; it will bring away a great deal of the infectious Humour.

Take Plantain, Rue, Southernwood, Shepherds-purse, Smallage, Coleworts, of each an Handful; bruise them, and with a Handful of Hens-dung, lay them in steep in a Pint of old Wash eight Hours; strain the Liquor, and add a Quart of Ale to it; put it on the Fire, consuming it to one half, and put into it an Ounce of Treacle, a Spoonful of Juice of Garlick, half an Ounce of Aniseeds, and the like Quantity of Liquorice, and give it luke-warm.

§. 4. *For the Worm in the Tail.*

This is a Distemper that breeds in the End of Cattles Tails, like unto an eating Canker, which will cause them to grow lean, and so weak in their Back, that they cannot rise when down, and sometimes will make their Teeth loose. You may know it by the Hair being eaten off where the Worm lies, and you may by feeling with your Fingers find some of the Joints eaten asunder.

To cure it, take Soot, Rue stamped, Salt and Butter, and mix them well together, and apply it to the Tail, having first slit the Inside of it about two or three Inches long, just above where the Joint fails, and rub her Teeth with Juice of Oranges, or  
Juice



Juice of Scurvy-grass; you may likewise give her the following Drink for inward Distempers.

§. 5. *For any inward Disease in Cattle.*

If you cannot find out what the Disease is, take a Quart of Ale, Wormwood, Rue, and Rosemary; of each an Handful, bruise it in a Mortar, boil it, and strain it; adding to it two Spoonfuls of the Juice of Garlick, as much of the Juice of Housleek, and as much *London-Treacle*; mix all well together, and give it luke-warm.

To know if any Distemper is growing upon them, view the Top of their Noses in a Morning, and if Pearls like Drops of Dew hang upon them, they are in Health; but if they are hot, dry, and scurfey, some Distemper is beginning to grow.

§. 6. *For any Imposthume, Boil, or Swelling.*

Take Lily-roots, boil them 'till they are a pap in Milk, and apply it hot to the Sore. When the Sore comes to be soft, you may open it with a hot Iron, if you find need, and heal it with Tarr, Turpentine and Oil mixed together, adding a little Hogs-lard to it when boiling-hot.

§. 7. *To kill Worms.*

Chop Savin small, and mix it with sweet Butter, roll it into Balls, and give it for two or three Days; after give them about a Pint of Sweet-Wort, in which dissolve a little black Soap, and it will bring them away; keep them warm after it, giving them warm Water, and without Meat three Hours.

§. 8. *Of Bleeding of a Cow.*

Except it is an extraordinary Case, never take above a Pint of Blood from a Milch-Cow at a time.

## §. 9. For a Looseness or Bloody-Flux.

Take some Sloes, boil them in a little Water, and add some powdered Chalk, and a little Quantity of Whiting to it, and put it when cold into the Water which the Cows drink.

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## Chap. VI. Of Sheep.

**S**heep are not only a very useful Creature, but very profitable too, and will be kept and fattened upon much worse Land than any of the former Stock; and therefore they are by some preferr'd before any other Sort of Cattle. The best breed for fine Wooll is *Hereford* and *Worcestershire*; but they are a small black faced Sheep that bear but a little burthen. *Warwick*, *Leicester*, *Buckingham* and *Northamptonshire*, bear a large boned Sheep of the best Shape and deepest Staple: *Lincolnshire* in the salt Marshes breeds the largest Sheep, but not the best Wooll, tho' they are lately much amended in their Breed. *Yorkshire*, and so Northwards, bears Sheep of big Bone, but their Wooll is rough and hairy. *Wales* bears a hardy small Sheep that hath the worst Wooll, tho' the best tasted Flesh. For Sheep, as well as other Cattle, buy them from a worse Land to bring on to a better, and see that they be big boned, and have a soft greasie well curled close Wooll, for such Sheep bear the best burthen, and are always most esteemed by the Butcher.

For the Choice of Sheep for breed, see that the Ram be young, and that his Skin be of the same colour with his Wooll; because the Lambs will be of the same colour with his Skin; that he be of a large long Body, his Fore-head broad, round, and well rising,

rising, his Eyes chearful and large, his Nostrils straight and short, &c. The polled Sheep (that is Sheep without Horns) are reckoned the best Breeders, because the Ewes yeare the polled Lamb with the least danger, and because so much of the Nourishment doth not go into the Horns. An Ewe should have her Neck large and upright, bending like a Horses, her Back broad, Buttocks round, thick Tail, small Legs but short, clean and nimble; the Wooll thick and deep, covering her all over: And to know whether they are sound or not, see that none of the Wooll be wanting, that their Gums be red, Teeth white and even, the Brisket-skin red, the Eye-strings ruddy, the Felt loose, the Wooll fast, the Breath sweet, and the Feet not hot: For if they are rotten, the Eyes are pale and dark, the Gums white, the Wooll easie to come off, the Teeth yellow and foul, and when dead you may see the Belly full of Water, the Liver putrefy'd, the Fat yellow, and the Flesh moist and waterish; as for their Age two Years old is the best Age to have Sheep at. In order to know which, when a Sheep is one Shear, as they call it, they will have two broad Teeth before; when two Shear, four; when three Shear, six; when four Shear, eight: And after that their Mouths will begin to break.

For Land to breed Sheep on, it is observed, that fat Pasture breeds straight, tall Sheep; and Hills and short Pastures breed square ones, Woods and Mountains small and slender Sheep; but the best for all Sheep is new plowed up Land, and all dry Grounds are good for Sheep; and so on the contrary, all wet, moist Lands are bad, especially such as are over-flowed, and soiled with Sand and Dirt, except the salt Marshes, the Saltness of which makes amends for their Moisture, any thing of Salt by reason of its drying Quality, being of great advantage to Sheep.

As for the time of putting the Rams to the Ewes, you must consider at what time of the Spring your Grass will be fit to maintain them and their Lambs, and whether you have Turneps to do it with 'till your Grass comes: For many times both Ewes and Lambs are killed for want of keeping; or the Lambs very often stunted in their Growth, which if once they get will be a very great hindrance to them, and a long time before they will recover it: And therefore as an Ewe goes twenty Weeks with Lamb, you may easily calculate the time for her, to take Ram in: But the best time for them to yearn in is *April*, except where you have very forward Grass, or Turneps, or that your Sheep are Field-sheep, where you have not Inclosures to keep them: Then it will be necessary to have them yearn in *January* or *February*, that the Lambs may be strong before *May-day* to follow the Ewes over the Fallows and Water-furrows: But then Lambs that come so early must have a great deal of care taken of them, and so must all other Lambs at their first Falling: Else while they are weak, the Crows and Magpies will be apt to pick out their Eyes: If you save the Grass and Weeds that grow in the Lands that you design to fallow in Winter, that is from *Christmas*, and turn your Ewes and Lambs into them in *March*, if you have a mild Winter, it will be a great help to them.

Your Ewes that are big, and other Cattle, should be kept but bare; because it is very dangerous for them to be fat at the time of bringing forth their Young, except only for about a Fortnight or three Weeks before they may be pretty well kept to get them a little into heart.

As to the weaning of Lambs in some places they never sever the Lambs from their Dams, especially in the best Pasture where the Ram goes constantly with the Ewes; because the Ewe when she goes to  
 Ram



Ram again, will go dry, and wean the Lamb herself; and likewise in unsound Pasture they reckon it the best for Lambs to run with the Ewes, because they seldom rot while they suck, except they want suck; and in such cases it is much better to sell them to the Butchers; but they that have sound Pastures may wean them at sixteen or eighteen Weeks old, if they find it inconvenient to let them run longer.

About *Michaelmas* you should separate the Male from the Female, and having chosen out the best, those which you design for Rams put by themselves, the rest geld that are not gelt already: But the best time of doing it is while they are very young.

The best time of shearing of Sheep is about the Middle or latter End of *June*; because it is good for them to sweat a little in their Wooll before you cut it; and they must be very well washed, which is a great help to the Price of your Wooll. Let them go two or three Days after in clean dry Ground before they be shorn; in doing of which the Shearer must take care not to hurt them with the Point of the Shears, nor yet to cut their Skins, because of the Flies; and see that the Wooll be well wound up. Some shear their Lambs too, which they do close behind, but very little before, especially the first Year; But before they are shorn, great care ought to be taken to tag them, as they call it, which is to clip away the Wooll of their Tails, and behind, that the Dung may not hang on it, which else will occasion them to be sore, and the Flies to blow them, and fill them with Maggots.

In *Gloucestershire* they house their Sheep every Night, and litter them with clean Straw, which affords a great advantage to their Land by the Manure, and they say makes their Wooll very fine.

In *Middlesex* and round *London* they buy *Waybill* Sheep, which are a Sort of Sheep bred in *Hamp-*

*Hampshire, Wiltshire, &c.* that Lamb very early, commonly before *Christmas* ; these Lambs they keep in little Penns in a House, and bring the Ewes two or three times a Day to them to suckle them, which quickly makes the Lambs fat even in the hardest Weather, especially if they have Turneps to give the Ewes ; because the Lambs are sheltered, and do not ramble about in extremity of Weather. Where they have not Turneps, some give to their Ewes the finest Hay, and Bran, and Oats.

Some make a great Improvement of their Lands by folding of Sheep upon them, which Folds they make with Hurdles, so as to remove them from one place to another ; and so when the Sheep have dunged one place, they new place the Folds, and dung another, by putting the Sheep into them every Night, which they only do in Summer-time, as near as they can in good Weather, because folding of them is apt to make them have the Rot ; and care should be taken when they are let out in a Morning, not to do it before the Sun is risen, and then they should be drove to a good Feeding-place ; for being hungry they will eat any thing that comes next ; the not observing of which, many times is a great Prejudice to them, especially in moist ill Ground ; but many reckon all Folding of Sheep to be very bad for them, particularly if Storms or ill Weather happen ; and therefore they rather chuse to stick Stakes sloping in the Ground, to which the Sheep will come and rub themselves, and so Dung and Urine on those Places where they stick them.

The great Inconveniency which attends Sheep, is their being subject to the Rot ; which it is a hard thing to prevent, if the Year prove very wet, especially in *May* and *June*, except it be in salt Marshes or in broomy Lands, Broom being one of the best Preservatives against that Distemper of any thing.

thing. I have known Sheep cured of the Rot, when they have not been far gone with it, only by being put into Broom-lands. Scurvy-grass, Parsley, Mustard and all other Sorts of hot Herbs, are good for the Prevention of it. Some propose to give Sheep once a Month, or oftner, half a Handful of Bay-salt, which may be of some Service to them: But as the Rot, Red-water, and most of the Distempers that Sheep are subject to, proceed from too much Moisture of the Land they feed on, and the Season of the Year; so I should think that dry Food at such times, and the keeping of them on dry Land in wet Seasons, and to give them fine Hay, Oats, Bran, &c. (amongst which some Salt might be mixed) might be the best and properest Food for them to prevent these Distempers. But I shall refer a fuller Treatise of these Sort of Cattle to my Appendix.

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### Chap. VII. *Of Goats.*

**G**oats are of Advantage to be kept in rocky, barren Places, where other Cattle cannot get a livelyhood: They will climb the highest craggy Rocks to feed upon Briars, Bushes, Heath, and other Wood: And tho' they will feed in plain Pastures, yet their chief delight is in browsing upon Trees; and therefore great care ought to be taken to keep them from all Sorts of valuable Plantations; the chief Profit of them is their Milk, which is esteemed the greatest Nourisher of all liquid things on which we feed (except Woman's Milk) and the most comfortable to the Stomach: Many mix it with other Milk in barren Countries, where they cannot keep many Cows to make Cheese with, for which use it doth very well: Their Kids also are very good Meat, which the best Sort of them com-

monly produce twice a Year, and two or three of them at a time; some Out-landish Sorts of them more. Some shear their Hair to make Ropes with, which will lie a long time in Water without rotting, and some make particular Sorts of Garments of it.

The Goat ought to have a large Body, well haired, great Legs, upright Joints, not bending, a Neck plain and short, Head small and slender, large Horns and bending, a big Eye, a long Beard: and the She should have large Teats, a big Under, hanging down Ears, and no Horns, at least very small ones.

For the ordering of them they should be kept in Flocks or Herds, that are used and associated together, or each Party will be apt to straggle from the other. They should have good shelter both from the heat in Summer, and cold in Winter: For they can neither endure the Extremities of the one or the other, especially the Shees which are with Kid. The best time for the Male and Female to go together, is about *December*. If you house them in Winter, let them have no Litter to lie on, because it is too hot for them; but let the Floor be paved, that they may be kept sweet and cleanly: For they cannot endure ill Savours. As for the Kids they are to be ordered in all things as they order Lambs.

If Goats are suffered to go and chuse their own Food, they are such good Physicians to themselves that they are seldom troubled with any inward Distempers; only the unnatural Excess of their Lust makes them soon grow old, and so quickly become past Use and Profit. They are reckoned very good to lie amongst Horses; the Scent of them, as they say, being of great Advantage to prevent the Horses falling into Distempers.



Chap. VIII. *Of Swine.*

**S***Wine* are very advantageous to the Country-man, not only for their great Increase, but also in that they feed upon what would otherwise be of no Use or Advantage, but would be flung away; as Whey, Washing of Tubs, Grounds of Drink, Dish-water, Grains, &c. And their Flesh being best salted or kept in Pickle may be eat in the Spring when other Meat is at the dearest, besides the helps it affords to the taking off Garden-Commodities, and the Variety of Dishes of the Offal. They are indeed very greedy and given much to root up Ground, and to break Fences; and therefore the more care must be taken of them to keep them well rung and well yoked.

The largest Swine, and the greatest Numbers for any particular Places, are bred in *Leicestershire*, and some Parts of *Northamptonshire*, and in the clay Countries thereabouts, which, I suppose, proceeds from the great Quantities of Beans and Pease sowed in those Parts.

The wild Kind are not so large as these Sorts, but are much hardier and better Meat.

In the Choice of Swine chuse such to breed of as are of long large Bodies; deep sided and bellied, that have a short Nose, thick Thighs, short Legs, high Claws, thick Neck, a short strong Groin, and a thick Chine well set with strong Bristles.

To have too many Sows in one Yard is not good, for their Increase is so great, that they will for want of Food, not only devour whatever comes in their way, but eat one another: For a Sow will bring forth Pigs three times in a Year, that is, at the End of every sixteen Weeks: And I have heard of a Sow that hath had twenty Pigs at a Litter: It is common for them to have thirteen or fourteen;

teen; but the Sow can rear no more than she hath Teats to suckle them with; the rest must be flung away, or put to other Sows. Some esteem them the best Pigs to keep for Store that suck the foremost Teats; but for what reason I cannot tell. If the Sow miss the time of going to Boar that she might in course have done, give her to eat some Oats parched in a Pan in her Wash, or the small End of the Runnet-Bag, which will cause her quickly to go to Boar. The Pigs which you rear, after you have chosen out the best for Boars and Sows, the Males must be gelt, and the Sows spay'd; the spay'd Gelts, as they call them, they esteem the more profitable, because of the great Quantity of Fat that they have upon their Inwards more than the Hogs. Young Shoots which are Swine of about three quarters of a Year old are best for Pork, and those of a Year or a Year and an half old for Bacon. The best Age for a Sow to bring forth Pigs is from one Year to seven Years old; and the best Pigs to rear are those which are pigged in the Spring.

The best way of taking care of Swine is to feed them so as to keep them in a good, midling Plight, 'till you design to fat them: For if you keep them too fat, it will indanger their Health; and too lean will make them too ravenous. 'Tis good to give them such swill as you have every Morning and Evening, to make them come home to their Coats; the rest of the day, let them graze, and get such Food as they can; only when Corn is upon the Ground, you must be careful to keep them within bounds. Moist sedgy Grounds are good for 'em, the Roots of which they will eat; and all Sorts of Haws, Hips, Sloes, Crabs, Acorns, Mast, Chestnuts, &c. with which if you have plenty enough to fat them, their Flesh will eat much better, and sweeter, than if fatted in a Stye: Only  
some

some say their Fat will not be so solid, nor so profitable: And therefore they commonly shut them up for a Week or ten Days, and feed them with dry Pease or Corn, to make their Fat firm. But 'tis a Mistake. I have killed Hogs fattened with Acorns, whose Fat was as solid as any fattened with Pease. In the fattening of Hogs in Styes, they observe to give them Meat often, but little at a time, that it may be always fresh; and likewise to give them as much Water as they will drink, and to keep them very clean, which will much help their Fattening, and mend the Taste of their Flesh. But where the Husbandman lives remote from Wood, or that the Year doth not hit for Acorns, or Mast, they commonly fat them altogether in Styes with Pease, if cheap; if dear, with the Meal of Barley, Rye, or Offal-corn, according as they are cheapest, which they mix with Water, Whey or Skim'd-milk, with which they feed them, 'till fat; which will commonly be in about a Month's time, and then they feed them with Pease, only a little before they kill them.

Observe, That every Stye have a Yard well paved with Stone, if you can, for the Hog to go out and ease himself in, that he may keep his Lodging the cleaner, and air himself.

In *Leicestershire* they have a very easie way of fattening great Numbers of Swine, which they do, by stacking up their Pease and Beans, which they shape like to the Form of a small Cottage. This they set near some running Brook, and hedge a Yard in round about it, taking some Part of the Stream into the Yard for the Hogs to drink at, into which they turn such a Number of Hogs as they think their Pease or Beans will fat, where they let them live 'till their Provision is consumed, cutting the Reek down, and giving it to them as they can eat it. By this way they fat very great  
Num.

Numbers, which they dispose of at *London* for Sea.

As to the Distempers that Hogs are subject to, they easily show their Illness, if they ail any thing, by the hanging down of their Ears, their dull heavy Looks, and the loss of their Appetite, which they never recover 'till they are well again. If you are to buy Hogs, and suspect their Healthiness, draw a Handful of Bristles against the grain of the Hair; and if the Root be white and clean, the Hog is sound; but if they be bloody or spotted, he is sick.

§. 1. *For the Gargol in Hogs.*

The Signs of which are hanging down of the Head, and carrying it on one side, moist Eyes, staggering and loss of Appetite. 'Tis occasion'd from corruption of Blood, ingendred by the eating of rotten Fruit, Garbidge or Carrion, rank Grass, wherein is much Hemlock, &c. For the Cure of which, first let them Blood under the Tail, and under the Ears, and give the following Drink.

Take Angelica, Rue, Staverwort, or Hog's-Madder, and May-weed, of each a Handful; shred them very small, and boil them in a Pint of Milk very well; and when 'tis cold enough, add to it a Penny-worth of Sallet-oil, and the same quantity of Treacle. This Receipt I had from one that has often try'd it, and tells me he never found it to fail.

§. 2. *For the Measels.*

The Sign of the *Measels* is, if you find under their Tongues small black Blisters, or that they cannot stand on their Hinder-legs, or that their Bristles when pulled out are bloody.

Give



Give the Hog in his Wash an Ounce of crude Antimony powder'd, and keep him in the Styre three or four Hours after giving of it, and repeat it 'till cured. Some give them Brimstone in their Meat, which they say is an extraordinary thing; and that if you give to a well Hog an Ounce of crude Antimony, it will make him fat above a Fortnight sooner than another Hog that hath the same Meat, giving half a Drachm at a time. If Hogs get a Swelling on the side of their Throat by eating of Acorns, lance it; and anoint it with Hog's Lard, and it will quickly be well.

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### Chap. IX. *Of Rabbits or Coneys.*

**R**abbits are very profitable Creatures for their great Increase, and their being kept on dry barren Sand or Gravel that will maintain nothing else; which the dryer 'tis the better for them; this Sort of Lands they much improve by their Dung for Rye. Besides which many make great Profit of them, by keeping of them in Hutches near great Towns, and some keep great Quantities of them in Pits for to catch, when they want them; they being a very ready dish upon any Occasion: But the Pits must be in a very dry warm Soil; if they are any thing deep, they will be else too cold, or too damp for them. I should rather prefer for them a large Barn made very tight after the way of making of Barns for preserving of Corn in, to keep Vermin out of: For the tame Rabbits must lie dry, and warm, or else they will not breed in Winter, which is the chief time of their Profit, and what makes them preferred before the wild ones, and they are much better Meat, if they have their Liberty; especially the white shock Turkey Rabbet.

Chap. X.

Chap. X. *Of Dogs.*

**D**Ogs are not reckoned among the Number of the profitable Cattle, but they are upon several occasions very useful to the Farmer, and what he cannot well be without; but there being several Sorts and Kinds, I shall leave the particular Description of them to the Lovers of Sport, who are the most concerned in being curious in the particular Kinds and Shapes of them. I shall only propose some Remedies that may be a help to some of their common Distempers; especially for that of Madness, which is a very prejudicial Distemper, not only in the loss of a good Dog, but in that he may infect the rest of the Stock; and be also very dangerous to the Family and Neighbourhood.

I shall in this Case, for the publick good, advise every one that keepeth a Dog, to have him wormed, which is a thing of small Trouble or Charge, and what, I believe, will prevent their being mad, if they are not bit with a Dog that is mad; and if they are, I am apt to think it prevents their biting of any other Creature; for I had three Dogs bit with mad Dogs at three several times that were wormed; and though they died mad, yet they did not bite or do any mischief to any thing I had. And having a mind to make a full Experiment of it, I shut one of them up in a Kennel, and put a Dog to him that I did not value. The mad Dog would often run at the other to bite him; but I found his Tongue so big swell'd in his Mouth that he could not make his Teeth meet. This Dog (though I kept him with the mad Dog 'till he died) did not ail any thing, though I kept him two Years afterward, and gave him no Remedies to prevent any Harm from the biting of the mad Dog.

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But as there are several Sorts of Madness in Dogs, so I cannot tell whether the Effects are the same in all. But my Dogs seemed to die of the black Madness, which is reckoned the most dangerous. And therefore I cannot tell how far the following Receipt may be effectual in all Sorts of Madness, tho' it has not failed in curing all the Dogs that were bitten, I have given it to; tho' all those I gave it not to, died. The Remedy is this. "Take white  
"Hellebore, and grate it with a Grater to Powder,  
"which you mix with Butter, and give it to the  
"Dog. The Dose must be proportioned to the size of the Dog; to a very small Lap-dog you may give three Grains, and to a large Mastiff sixteen Grains; and so in proportion to other sizes. The best way is to give but a small Quantity at first: You may increase the Dose as you find it to work, or not to work. But as 'tis a strong Vomit, and what will make them very sick for a little time; so you must be careful to keep them warm that Day you give it, and the next Night, and do not give them any cold Water; but when it hath done working, towards the Afternoon, give them some warm Broth: And the next Morning give the same before you let them out. This is an extraordinary Remedy likewise for the Mange; I never knew three Doses of it fail of curing any Dog that had it, except he had a Surfeit with it: Which if he have, let him bleed also, and anoint him two or three times over with Gun-powder and Soap beat up well together, and it will cure him.

I have heard of a Gentleman who cured several Creatures that were bit with mad Dogs, with only giving them the middle, yellow Bark of Buckthorn, which you must boil in Ale for a Horse or Cow, and in Milk for a Dog; and being bit with one himself, he adventured to take nothing else, and did very well. You must boil it 'till 'tis as bitter as you can take it.

Chap. XI. *Of Fowls.*

**T**HE Country-man's Farm or Habitation cannot be said to be compleatly stored or stocked without *Fowl* as well as *Beast*, which yield a considerable Advantage by their Eggs, Brood, Bodies and Feathers. Any poor Cottager that lives by the High-way-side may keep them, they being able to shift for themselves the greatest Part of the Year, by their feeding on Insects, Corn, or any thing almost that is edible by any other Sort of Animal : And therefore they are kept to great Advantage at Barn-doors, and other Places, where Corn or Straw is scattered.

As for Cocks and Hens, I shall not enter into a Description of the several Sorts of them, only advise you to chuse those that are the best Breeders, and the best Layers; the oldest being always reckoned the best Sitters, and the youngest the best Layers; but no Sorts will be good for either, if they are kept too fat: The best Age to set a Hen for Chickens, is from two Years old to five; and the best Month to set them in, is *February*, tho' any Month between that and *Michaelmas* is good. A Hen sits twenty Days, whereas Geese, Ducks and Turkeys sit thirty. Observe to let them have constantly Meat and Drink near them while they sit, that they may not straggle from their Eggs, and chill them.

One Cock will serve ten Hens.

If Fowls are fed with Buck or French-Wheat, or with Hemp-seed, they say, they will lay more Eggs than ordinary; and Buck-Wheat either whole or ground, and made into Paste, which is the best way, is a Grain that will fat Fowls or Hogs very speedily; but the common Food to fat them with,  
is



is Barly-meal wet with Milk or Water; but Wheat-flower is better.

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Chap. XII. *Of Geese.*

**G***ee*se are profitable many ways, as for Food (for which they commonly bear a good Price) their *Feathers*, and their *Grease*. They will live upon Commons or any Sort of Pastures, and need little Care or Attendance; only they should have plenty of Water. The largest *Geese* are reckoned the best: But there is a Sort of Spanish Goose, that is a much better Layer, and Breeder, than the English; especially if the Eggs are hatched under an English Goose.

*Geese* lay in the Spring, the earlier the better; because of their Price, and of their having a second Brood. They commonly lay twelve or sixteen Eggs a Piece. You may know when they will lay, by their carrying of Straw in their Mouths; and when they will sit, by their continuing on their Nests after they have laid. A Goose sits thirty Days; but if the Weather be fair and warm, she will hatch three or four Days sooner. After the Goslings are hatched, some keep them in the House ten or twelve Days, and feed them with Curds, Barly-meal, Bran, &c. After they have got some strength, let them out three or four Hours in a Day, and take them in again, till they are big enough to defend themselves from Vermin. Others put them out at first, and I think they do as well. One Gander will serve five *Geese*.

If you would fat Green *Geese*, you must shut them up when they are about a Month old, and they will be fat in about a Month more. Be sure to let them have always by them in a small Rack some fine Hay, which will much hasten their fattening.

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ting. But for fattening of older Geese, 'tis commonly done when they are about six Months old, in or after Harvest, when they have been in the Stubble Fields, from which Food some kill them ; which is a good way : But those that have a mind to have them very fat, shut them up for a Fortnight or three Weeks, and feed them with Oats, spelted Beans, Barly-meal, or Ground Malt mixed with Milk. But in fattening of all Water-Fowl you may observe that they usually sit with their Bills on their Rumps, where they suck out most of their Moisture, and Fatness at a small Bunch of Feathers, which you shall find standing upright on their Rumps, and always moist, with which they trim their Feathers, which makes them oily and slippery more than other Fowl's Feathers are, that the Water may slip off them, which, if cut away close, will make them fat in less time, and with less Meat than otherwise. Geese will likewise feed on, and fatten well with Carrots cut small and given them.

In some Countries they shear their Geese for their Feathers, and some pull them twice a Year ; but this latter way is more injurious to them, and therefore 'tis better staying 'till Moulting-time, and 'till their Death for their Feathers.

### Chap. XIII. *Of Ducks and other Water-Fowl.*

**T**AME *Ducks* are very necessary for the Husbandman's Yard, in that they require no charge in keeping ; they live on lost Corn, Worms, Snails, &c. for which reason they are very good for Gardens. Once in a Year they are very great Layers of Eggs, especially a Sort of Duck that turns up the Bill more than the common Kind ; and when they sit they need little Attendance, except to let them have

have a little Barly or Offal-Corn and Water near them, that they may not straggle far from their Nest to chill their Eggs. For the ordering of their Young, 'tis much the same way with that of *Geese*. They are reckoned to be better hatched under a Hen than a Duck; because while they are Young, the Hen will not lead them so much into the Water. Some reckon it very good to cut off the Feathers of their Rumps; because when their Tails are wet, it often occasions their drowning. As to the fatting of them, you may do it in three Weeks time, by giving of them any kind of Corn, or Grain, and good Store of Water. Ground Malt wet with Milk or Water is best.

If you would preserve wild Ducks, Teal, Widgeon, Shell-ducks, &c. you should have a Place walled in with a Pond in it, that hath good shelter, upon some Island, or Place near it, that the Duck may hide her Eggs from the Drake, who will suck them if he finds them.

There is likewise a Sort of Ducks called *Decoy-Ducks*, that will bring whole Flights of Fowl to their Retirements, where are Conveniencies made for the Catching of them; a Description of which I shall leave to my second Volume.

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#### Chap. XIV. *Of Turkeys.*

**T***urkeys* are a Fowl that prospers very well in open Countries, where there is not much shelter to harbour Vermin to destroy them; for they are subject to ramble. The Hens likewise are so negligent of their Young, that whilst they have one to follow them, they never take any care of the rest; and therefore there must be a great deal of care taken of them while they are Young, to watch them, and to keep them warm, they being an ex-

treme chill Bird. But some, where they have a Conveniency of a small Covert near their House, let them take their Liberty, and seek their own Nests; but 'tis only in some particular Places that they do well with such Management. I knew a Gentleman that had a Hen-Turkey of the wild Kind from *Virginia*; of which, and an *English* Cock, he raised a very fine Breed, that bred wild in the Fields, and always became tame when grown up; they were a very hardy Breed, and much larger than ours, and reared their Young ones without any Care or Trouble, breeding much better than our *English*.

If you keep them with Corn, they are very great Feeders, and will devour a great deal; but if left to their Liberty when grown up they will get their own Livings without either Trouble or Charges, by feeding on Herbs, Seeds, &c.

Turkeys being very apt to straggle will often be laying their Eggs in secret Places; and therefore the common Sort of them must be often watched, and made to lay at home. They begin to lay in *March*, and will sit in *April*. Eleven or Thirteen Eggs are the most they should sit on. They hatch in between twenty five and thirty Days: And when they have hatched their Brood, be sure to keep the Young ones warm; for the least Cold kills them: Feed them either with Curds or green, fresh Cheese cut in small Pieces. Let their drink be new Milk, or Milk and Water. Some give them Oat-meal and Milk boiled thick together, into which they put some Wormwood chopp'd small, and sometimes Eggs boiled hard, and cut in little Pieces. You must feed them often, for the Hen will not take much care of them, and when they have gotten some strength, feed them abroad in some close walled Place, where they cannot stray, and do not let them out 'till the Dew is off the Grass,



Grass, taking care to have them in again before Night, because the Dew is very prejudicial to them.

For the fattening of Turkeys, sodden Barley is very excellent, or sodden Oats for the first Fortnight, and for another Fortnight, cram them as you do Capons. They are only to be crammed in a Morning, which must be given to them warm, and let out all day, being sometimes fed with Corn while out; because, being a sullen Bird, they are apt else not to fat so kindly. Their Eggs are esteemed very wholesome, and a great Restorer of Nature.

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### Chap. XV. *Of Pigeons.*

**P***igeons* or *Doves* are of several Sorts, both the wild and tame Kind, as Wood-pigeons, Rock-pigeons, Stock or Ring-doves, Turtle-doves, Dove-coat-pigeons, and several Sorts of tame Pigeons that are commonly fed by hand, and kept for the largeness of their Bodies, Beauty and Diversity of their Colours. They breed almost every Month of the Year. We shall only treat here of such as are or may be kept in Dove-coats, which bring a considerable Advantage to their Owners, with little Cost or Trouble, only the feeding of them in Frost or Snowy Weather, when nothing is to be had abroad; and about Midsummer, before Pease are ripe; which Time is usually called *Benting-time*, because then Necessity forceth them to feed on Bents, or Seeds of Bent-grass; about which time they usually have a great many Eggs and young Ones, which will be starved if they are not helped. But Pigeons thrive best in open Countries, because there generally is the most Corn: And the Gunners cannot get behind a Hedge to shoot them, especially in such Countries as they sow a great  
O 3 many

many Gray-pease and Horse-beans in; for they are sowed the first of any Sort of Grain; their early feeding on which occasions them to be forwarder in breeding than in other Places.

There is nothing the Pigeons more affect than Salt; for they will pick the Mortar out of the Joints of Stones or Brick-walls meerly for the Salt-ness thereof; therefore many give them as often as need requires, a Lump of Salt which they usually call a Salt-cat, made for that Purpose at the Salterns, which makes the Pigeons much affect the Place. If Lime be mixed with Sand, Loam, and a little Salt put to it, and laid near, or put into the Pigeons-house, they will delight much to pick it: But it must not be made so strong as common Mortar.

Where I formerly liv'd, I got a Pair of Ring-Dove's Eggs, and hatched them under a tame Pigeon, and they lived with the Pigeons, and bred much better than the Pigeons, that in a little time I had great Increase of them; so that I believe I might have stocked a Dove-coat with them. They are much better than any other Sort of Pigeons, for the Largeness of their Bodies and their Hardiness; and in Winter-time they will live upon Ivy-berries, Turneps, and a great many other things that Pigeons will not. But being oblig'd to remove my Habitation, I have not since been able to make a thorough Experiment of them. I suppose Turtle-Doves will do the same, because I have often seen in the Road going to *Epsom* near *Non-such-Park*, among a Flock of Pigeons that is commonly thereabouts (which I suppose belongs to some Gentleman near that Place) a great many of that Sort with them, and are as tame as the Pigeons. Pigeons are sometimes apt to be scabby on the Backs and Breasts, which Distemper will kill the young Ones out-right; and  
makes

makes the old Ones so faint that they cannot take their flights to procure Meat, which starves them by degrees, so that whole Dove-coats are often destroyed with it. To cure which Distemper,

Take a Quartern of Bay-salt, and as much common Salt, a Pound of Fennel-seed, a Pound of Dill-seed, as much Cummin-seed, and an Ounce or two of *Affa-fœtida*: Mix all these together with a little Wheat-flour, and some fine worked Clay; when it is well beat together, put it into two Pots, and bake them well in an Oven; and when they are cold, lay them long-ways on the Stand or Table in the Dove-house.

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### Chap. XVI. *Of Swans.*

**S***Wans* are commonly kept for their Stateliness, and Beauty, tho' they are very useful to keep Ponds and Rivers clear of Weeds; upon which, and Grass they only feed, and not upon Fish, as many pretend, and are neither chargeable nor troublesome to keep, if you have but room enough for them. The young Ciguets are extraordinary good Meat, if fatted with Oats, their Flesh being the best of all Water-fowl; but if fed with Weeds, they taste fishy; therefore the best way is to put them where there is a good Quantity of Weeds, and to get them as fat as you can with them, and then to feed them for three Weeks or a Month, with Oats put in a Trough in Water. But they being a large Fowl must not be kept in a strait Place, because their Dung will taint them; but in some inclosed Pond where they may have room to come ashore, and plume themselves.

They commonly lay seven or eight Eggs, sometimes ten or eleven, but seldom have patience to hatch them all; tho' I have known a Swan to have

nine young Ones ; but their common Number is four or five. The Hen sits about six Weeks ; and if while she sits you set some Oats once in a day in a Trough in the Water some-where near her ; if she have not plenty of Weeds just at hand, it will do well to prevent her leaving of her Eggs ; and likewise if you set up some Boughs or other shelter to preserve her from the Heat of the Sun.

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### Chap. XVII. *Of Peacocks.*

**P***ea*cocks are usually kept for their Beauty and Comeliness, and more for Variety and Pleasure than Profit, except near great Towns where many Customers may be found to purchase them. They are beneficial to the Places where they are kept, by clearing of them from Snakes, Adders, Efts, &c. upon which they will live. The young Ones, some say, are extraordinary Meat ; but then they should be kept up three Weeks or a Month before they are killed ; and fed with Corn, and not suffer'd to feed on their usual Food.

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### Chap. XVIII. *Of Pheasants, Partridge and Quail.*

**T**Hese being troublesome and chargeable to keep, because the young ones must for the first Month be fed with Ants-Eggs, and for the cost of the places that should be made to keep them in, (tho' some make advantage of them near *London* to sell to Gentlemen as Rarities ; especially those that have the white Breed, and such as are very fine colour'd, having Rooms and Places made on purpose to keep them in ; ) I shall recommend them rather to Gentlemen than to the Farmer ; and pro-



proceed to consider his Advantage from that of Insects.

For over and above his Stock of Cattle and Fowl, wherewith the Country-farmer is replenished, there are several Sorts of Insects that being judiciously and carefully manag'd, may bring into the Husbandman's Purse no small Advantage. Amongst many of them that are useful in several Countries, and to several Ends and Purposes, we have here only two that are familiarly known and preserved amongst us, which is the Bee and the Silk-worm, of which we shall treat apart; and first

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### Chap. XIX. *Of Bees.*

**B**EES are to be valued for their Profit, and the small Trouble that attends them, there being no Fruit nor Flower, no Wood nor Forest, no Hill nor Dale, no fruitful nor unfruitful Soil, but what affords them matter to work upon; nor is there any time wherein they are idle, except the extremest Cold and wet Season.

A convenient and necessary Place ought to be made choice of for your *Apiary*, or Bee-garden, to place your Hives in; which, if 'tis near the House, is the most convenient for to look after at swarming Times, and on other Occasions: Let it be securely fenced from all Cattle, especially Hogs, and from all Sorts of Fowl, whose Dung is very prejudicial to them, and be well defended from high Winds on every side with such Fences as may let the Sun to them; but the North should be shelter'd with some high Buildings or Brick-wall that is solid, that it may keep the Wind from coming through it as well as over it: That Place being best for them, that is most exposed to the South, and where they may have the best opportunity to

*Apiary.*

to settle at their Hives, when they come loaden Home.

It is also very convenient to plant several Trees and Shrubs at some reasonable Distance, near Home, for them to pitch on at their swarming, that they may not be in danger of being lost for want of a Lighting-place. Limes, Phyllyreas, Sycamore-Trees, and Firs are particularly good to be planted near them; because from their Flowers they draw a great deal of Honey and Wax.

*Seats or  
Stools.*

The Place being fitted, the Seats to set the Hives on are to be provided; which, whether they be Stools or Benches, must be set a little shelving, that the Rain may neither run into the Hive, nor stay at the Door.

'Tis not reckon'd good to set any Hives on a Bench; because in Winter it may cause the Bees to fight, by going into one another's Houses, which they may sometimes mistake for their own; and therefore some esteem single Stools best, which are to be set at about two Foot distance from one another, and to be supported with four Legs, about twelve or fourteen Inches from the Ground. For their size they should not be above half an Inch or an Inch bigger than the Hive, save only before, where there ought to be the Space of three or four Inches, that the Bees may have room enough to light upon it. The best Stools are of Wood. Those of Stone are too hot in Summer, and too cold in Winter.

The Stools should be set towards the South, or rather a Point or two to the West, that the Hive may somewhat break the East-wind from the Door, and stand in straight Rows from West to East.

*A Cot or  
House.*

Mr. Worlidge proposes to make for every Hive of Bees, you intend to keep, a Cot or House of about two Foot square, and two Foot and a half high, set on four Legs, about ten Inches above Ground,

Ground, and five or six Inches within the Ground, and cover'd with Boards or Tyles to cast off the Rain, the Back or North-side being closed up very close, and the East and West-sides to have Doors to open and shut at pleasure, with Hasps to them, and at the Face or South-side to have a Falling-door that may come about half way down, which is to be elevated at pleasure, and serves in Summer for a Pent-house; not only to beat off the Rain from the Hives, but to defend them from the extreme Heat of the Sun, which is apt to melt their Honey. The other lower half should have two small Doors to open to either hand, which will serve to defend the Holes of the Hives from injurious Winds. When the Winter approaches, and the cold Winds are like to injure the Bees, you may then fasten all the Doors, which will defend the Bees from the Extremes of Heat and Cold, both which are injurious to them.

In Winter if you find them stand too cold, you may stuff Straw within the Doors to keep them warm; but the Extremity of Cold doth not do them so much Injury as Wet; which these Cases best preserve them from: They likewise prevent the Bees getting abroad upon every Sun-shine-day, because the Hives stand six or eight Inches within the Doors, which makes them dark, and the Bees insensible of a small Heat; when after the common way of Stools or Benches, the Sun casts its Rays to their Doors; which Warmth and Light together excites them forth to the Expence of their Provision, and the Loss of their Lives, as is evident by frequent Experience; the mildest and the clearest Winters destroying or starving the most Bees; whereas the coldest and most frosty Winters best preserve them.

In Spring, as soon as the Willow or Withy Blossoms appear, you may open the under Doors, that  
the



the Light and Warmth of the Sun and Air may encourage them to work ; or else you will hinder their early breeding, and make them slothful.

*Hives.* Several Sorts of *Hives* are used in several Countries ; but the general Sort used in *England* is Wicker-hives made of Privet, Willow, or Harl daub'd with Cow-dung temper'd with Dust, Ashes or Sand ; or Hives made with Straw bound with Brambles : Some out of Curiosity that they may see the Bees work, have them made of Wood with Glass, but they are very cold ; so that Bees do not thrive well in them. Others have placed double Hives one by another, and some upon the tops of others, that so by the taking of one of them away they may leave the other for the Bees without driving or killing of them : But as I cannot find any of these Experiments brought to perfection ; so I shall refer the treating of them, 'till I can get a full Account of some experimental Progress that is made in them.

*Form.* The best Hives, and those that are the most in use and warmest, are the Straw-hives ; the bigness of which should be of between five and seven Gallons, of a round Form, rather broad than high ; but you ought to have of each size, that you may suit your Swarms to them according as they are bigger or lesser ; and where you design to multiply your Stock, make use of the small Hives, and of the larger when you desire a great deal of Honey.

*Trimming the Hives.* Your Hives being thus made, you must dress them after this manner : Take off all the staring Straws, Twigs and Jaggs, that are offensive in the Hive, and make them as smooth as possible. If you need but few Hives, you may prune them with a Knife : If many, singe, and rub them with a Piece of Brimstone.

Your



Your Hive being pruned, put in your *Spleets*, *Spleets*. three or four of them, as the largeness of your Hive shall require: The upper Ends whereof set together at the Top of the Hive, and the lower fasten about a Handful above the Skirt. Besides these *Spleets*, the Straw-hive should have four other *Spleets* driven up into the Skirts to keep the Hive from sinking when it is loaded; two of which are the two Door-posts, the other two are hind Posts set at equal Distances.

In Swarming-time the Hives that you are mind- *Dressing*. ed to use, rub with sweet Herbs, as Thyme, Baum, Savoury, Marjoram, Fennel, Hyssop, Beantops, &c. and when the Swarm is settled, take a Branch of the Tree, whereon they pitch, and wipe the Hive clean with it, and wet the Inside of the Hive with a little Honey, Mead, Salt and Water, small Beer, or Honey and Milk, or Sugar and Milk.

In the next place your Hives must be kept close for defence of your Bees, first, from the Cold by mixing of Cow-dung with Lime or Ashes, and with Sand, with which you must stop up the Edges of the Hive round, and against Winter put a Wicket of a small Piece of Wood, in which are three or four Notches cut just big enough for the Bees to go in and out at, that no Vermin may get into them.

If the Spring be mild, calm, and showering, 'tis *Swarming*. good for Swarms; and they will be the earlier: But if it prove a cold, dry, windy Spring, then will there be but few Swarms, and those also backward. Dry Weather makes plenty of Honey, and *Moist* of Swarms.

About the Middle of May in an early Spring, you must begin to look after them, and observe what you can of the usual Signs, that precede their Swarming, that you may be the more watchful  
over

*Hives.* over those that require it. When the *Hives* are full (before which they will never swarm) they will cast out their Drones, altho' they be not quite grown, and the Bees will hover about the Doors. In cold Evenings and Mornings, there will be a Moisture or Sweating upon the Stool, and they will continually be running up and down hastily, and lie out in sultry Evenings and Mornings, and go in again when the Air is clear.

If the Weather be warm and calm, the Bees delight to rise; but especially in a hot gleam after a Shower or gloomy Cloud hath sent them Home together. Then sometimes they gather together without at the Door not only upon the Stool, but the Hive also: Where when you see them begin to hang in Swarming-time, and not before, you may be sure they will presently rise if the Weather hold.

To lie forth continually under the Stool or behind the Hive, especially towards the Middle of *June* is a sign or cause of not swarming: For when they have once taken to lie forth, the Hive will always seem empty, as tho' they wanted Company, and they will then have no mind to swarm.

Much stormy and windy Weather also will not suffer them to swarm when they are ready, and that makes them lie out; and the longer they lie out, the more unwilling they are to swarm.

Another cause of lying out is continual hot and dry Weather, especially after the Solstice; which causing plenty of Honey both in Plants and Dews, their Minds are so set upon that their chief delight, that they have no leisure to swarm, altho' they might most safely come abroad in such Weather.

*To make  
them  
swarm.*

But to make them swarm, some keep the Hives as cool as may be, by watering and shadowing both them and the Place where they stand, and then enlarging of the Door to give them air, they move the Cluster gently with their Brush, and drive them in. **If**

If yet they lie out and swarm not, then the next calm warm day about Noon, while the Sun shineth; put in the better part with your Brush, and the rest gently sweep away from the Stool, not suffering of 'em to cluster again. These rising in the calm and heat of the Sun, by their noise, as tho' they were swarming, will make the other come forth perhaps unto them, and so they may swarm.

Divers other ways have been attempted to cause Bees to swarm, as by placing a large Pewter-platter under the Cluster of Bees as they hang out in the Heat of the Sun, so as it may strongly reflect the Heat upon them, which will provoke them to swarm.

If none of these ways will cause them to swarm, but that they lie forth still near the Hive enough to let them in, and cloom up the Skirts all but the Door: If this succeed not, there is no Remedy.

The Signs of After-swarms are more certain. *After-swarms.* When the prime Swarm is gone, about the eighth or tenth Evening after when another Brood is ready, and again hath over-filled the Hive: In the Morning before they swarm they will come down near the Stool, and there they call one another, and at the time of swarming, they descend to the Stool, where answering one another in more earnest Manner with thick and shriller Notes, the Multitude come forth in great haste, &c.

If the prime Swarm be broken, the second will both cast and swarm the sooner, it may be the next day, and after that a third, and sometimes a fourth, but all usually within a Fortnight: Sometimes also a Swarm will cast another that Year.

When the Swarm is risen, 'tis the usual Custom to make a noise with a Pan, Kettle, Mortar, &c. but some reckon it an insignificant Ceremony, and others esteem it prejudicial. But if they are  
like



like to be gone, cast Dust or Sand amongst them, to make them come down.

When your Swarm hath made choice of a Lighting-place, you shall quickly see them knit together into a Cluster: When they are fully settled, and the Cluster hath been a while at the biggest, then hive them. And having in Store several Hives of several Bignesses, make choice of one that the Bees may go near to fill it that Year, but rather under-hive a swarm, than over-hive them, and rub the Hive with sweet Herbs as is before directed.

*Hiving  
them.*

Let the Hiver drink a Cup of good Beer, and wash his Hands and Face therewith, or being otherwise defended, if the Bees hang upon a Bough, shake them into the Hive, and set the same upon a Mantle or Cloth on the Ground, as is usual; or you may cut off the Bough if it be small, and lay it on the Mantle or Cloth, and set the Hive over it, which is the better way.

If they light near the Ground, lay your Cloth under them, and shake them down, and place the Hive over them; and such Bees as gather together without the Hive, wipe them gently with your Brush towards the Hive: And if they take to any other Place than the Hive, wipe them off gently with your Brush, and rub the Place with Wormwood, Nettles, May-weed, &c. Then set the Swarm as near as you can to the Lighting-place, 'till all be quiet; every one knowing his own House.

*Swarm  
parting.*

If the Swarms part, and light in sight of one another, let alone the greater, and disturb the lesser Part, and they will fly to their Fellows: But if not in sight, hive them both in two several Hives, and bring them together; shaking the Bees out of one Hive on the Mantle, whereon the other Hive stands, and place the other full Hive on them, and they will all take to it.

If



If it happen that your Swarm come late after the Middle of *June*, and that they are small, under the Quantity of a Peck; then put two or three of them together, whether they rise the same day, or in divers; for by this uniting they will labour carefully, and gather Store of Honey, and stoutly defend themselves against all Enemies. The Manner of uniting of them is thus :

In the Evening when it waxeth dark, having spread a Mantle on the Ground near unto the Stool, where this united Swarm shall stand, set a Pair of Rests, or two Supporters for the Hive; knock down the Hive out of which you intend to remove your Bees upon the Rests; then lift up the Hive a little, and clapping of it between your Hands to get out the Bees that stick in it, lay it down sideways by the Bees, and set the Stock or Swarm to which you would add them, upon the Rests or Supporters over them; and they will forthwith ascend into the Hive; those that remain in the empty Hive, by clapping it will hasten after their Companions. When you have gotten them all in, either that Night or early the next Morning, place the Hive on the Stool, &c.

Some reckon it better to place the Hive where in you have newly put your Swarm you intend to drive into another, in a place that the skirts may be uppermost, and set the other upon it, binding them about the skirts with a Towel: And so let them stand 'till the Morning, and the Bees will all ascend, that you may the next Morning set the Receiver on a Stool: And thus may you put three or four Swarms together: But observe to unite them the same Evening, or the next at farthest, that they swarm; lest having made Combs, they are the more unwilling to part from them.

In these several ways of dealing with Bees, 'tis *Bees sting-*  
good to defend ones self as well as may be against *ing.*

P

their

their Stings ; the securest way of doing of which, is to have a Net knit with so small Mashcs, that a Bee cannot get through ; and of fine Thread or Silk large enough to come over your Hat, and to lie down to the Collar of your Doublet ; through which you may perfectly see what you do, without any danger, having also on your Hands a good Pair of Gloves ; Woollen ones are the best.

If a Bee happen to catch you unawares, pull out the Sting as soon as you can, and take a Piece of Iron and heat it in the Fire ; or for want of that, take a live Coal, and hold it as near, and as long to the Place, as you can possibly endure it, and it will attract the fiery Venom, and afterwards anoint it with some Honey or Mithridate.

As soon as a Swarm hath enter'd its Hive, they immediately ( if the Weather will permit ) gather Wax, and build Combs ; that in a few days time there will be large and compleat Combs. They lie so thick about them, that 'tis impossible one quarter of them can be employ'd at once, until the Combs are brought to a considerable length, and then a great part of them may be employ'd in filling them, and the rest in finishing their Cells or Combs.

Their Number towards the End of Summer begins to lessen ; for in their Prosperity at Swarming-time, and shortly after they are far more in Number, than in the Autumn or Winter, as you may easily discern between the Quantity and Number of a Swarm, and those you kill when you take them ; for the Bees of the last years breed do now by degrees waist and perish by their extraordinary labour, their Wings decay and fail them ; so that a Year, with some advantage, is the usual age of a Bee, and the young only of the last Spring survive and preserve the kind till the next.

There

There are several things that are injurious to Bees, and much hinder their Prosperity, if not prevented.

1. *Noise*, which may in part be remedied by the Situation of the Apiary free from the noise of Carts, Coaches, Bells, Echoes, &c. *Enemies to Bees.*

2. *Smoak*, where Land hath been Burn-beaten near unto an Apiary, and the Wind hath brought the Smoak towards it, a great many of the Bees have been killed; which is the reason they will not thrive in or near great Towns.

3. *Ill Smells* are very offensive to them.

4. *Ill Weather*, as Wind, Rain, Cold, Heat, &c. which is prevented by the Situation and Fencing of the Apiary, and ordering of the Stocks as before.

5. The *Mice*, *Birds*, and other devouring Creatures which are to be destroyed.

6. *Noisome Creatures*, as Toads, Frogs, Snails, Spiders, Moths, Ants, &c. which you must endeavour to keep from them, and cleanse also the Hives ever and anon from these Vermin.

7. *Hornets and Wasps* in such years wherein they abound, prove great Enemies to the Bees, by robbing them of their Honey; they are destroyed by placing near the Door of the Hive a Glass Vial half full of Beer, Cyder, or any such thing, if some Sugar be added to it, it will do the better.

8. Bees themselves prove the greatest Enemies both by *fighting* and *robbing*. Several occasions provoke the Bees to fight; which, if the Battle be but newly begun, may be hindred by stopping up the Hive close: but if it be gone so far that most of the Bees are out, the casting of Dust among them was the ancient way.

The best time to remove an old Stock is a little before or a little after *Michaelmas*; or, if you have overslipt that time, then about the end of *February*, or beginning of *March*, before they go



much abroad, lest it prevent their swarming. You may remove them at any time in the Winter, but not so well as in the forementioned Seasons. The best time of the day to do it is in the Evening, next after Hiving, let the Weather be fair, and do it in the Evening when the Bees are quiet; the best way of doing of which is thus:

Take a Board about the breadth of the bottom of the Hive you intend to remove, and in the Evening, or two or three Evenings before, lift it up and brush the Bees that are on the Stool forward, let the Board be a little supported by two Ledges, to prevent the Death of the Bees on the Stool. On this Board set the Stock, and so let them stand till you remove them; when you come to remove them, stop up the Door of the Hive, and set the Board whereon the Hive standeth, on a Hand-bar-row, and carry them to the place you intend.

*Feeding of  
Bees.*

The feeding of Bees is of little use; first, because the Bees that have not a profitable stock of Honey to serve them over the Winter, are not fit to keep: and then, because they that are Bee-masters, and have not care enough of them to keep them from spending of that Stock they have in Winter-time, must not expect to reap any considerable Advantage by them; and it may be presumed will never take so much Pains and Care as is required in feeding of them.

There are some Stocks of Bees in the Spring time that may seem worthy of our care to preserve, *viz.* Such as having but a small Stock of Honey, and a good Quantity of Bees, by means of a cold, dry, unseasonable Spring, cannot make such timely Provision as in other Years they might have done, yet in all probability may prove an excellent Stock, and may be worth our assistance. Food may be afforded to them several ways, but the best is by small Canes or Troughs convey'd in-

to



to their Hives, into which you may put the Food you give them: It must be daily continu'd till the Spring-Season affords them ease and Provision abroad, because at that time their Combs are full of young Bees.

Of all Food Honey is the best and most natural, which will go the farther, if it is mixed well with a moderate Proportion of good Sweet-wort. Some prescribe Toasts of Bread sopped in strong Ale, and put into the Bee-hive, whereof they will not leave one Crum remaining; some also advise to put into the Hive dry Meat, or Flour of Beans; others Bay-salt, roasted Apples, &c. which are very good, especially Salt: which if some were mixed with Water, and always set near them, it might do well, it being certain, that Bees near the Sea always thrive the best; which some attribute to their drinking of Salt-water, that they fly (say some) many Miles to get.

Mr. Worlidge proposes for the improvement of Bees, to take a handful of Baum, one Dram of Camphire, half a Dram of Musk dissolved in Rose-water, as much yellow Bees-wax as is sufficient, Oyl of Roses as much; stamp the Baum and Camphire very well, and put them in the melted Wax with the Oyl of Roses, and so make it up into a Mass, letting of it Cool before you put in the Musk; for otherwise the Heat will fume away most of the Scent.

Take of this mass so much as a Hazle-nut, and leave it within the Bee-hive; it will (as he says) much increase the number of the Bees, and you shall also find both of Honey and Wax three times more profit, than otherwise you should have had.

A great thing to advance your Bees is the having of Fields near you, sow'd with Brank, Coleseed, or Turneps, from which they will draw great Quantities of Honey. Beans also are good for them.

*Profit of  
Bees.*

As the chief aim of the Keeper of Bees is an Advantage by their Honey and Wax ; so many have endeavour'd to find out some way to reap the profit of Bees without destroying them. One way

*Driving of  
Bees.*

of that has been used for this purpose is *driving* of them after this manner. In *September*, or any time after they have done breeding (else the Honey will be corrupted by the young Bees in the Combs) place the Hive you intend to take, with the bottom upwards, between three or four Stakes, and set the Hive you intend to drive the Bees into, over the same as before was directed, in the uniting of Swarms; then often clap the under Hive between your Hands in the Evening; and so let them stand till Morning: and then clap it again, and get as many Bees out as you can, which will repair to the other Hive. This way is something troublesome to the unexperienc'd; yet beneficial in such Cases, where you have a great Stock of Honey and few Bees in one Hive, and a small Stock of Honey in another: by which means you save the Lives of your Bees, which will gladly exchange their hungry Habitation for a more plentiful.

*Profit of  
Bees.*

But these ways have altogether fail'd the Designs of the Undertakers, as I said before. So I shall at present only describe the common Usage, which is the taking of the Combs by killing of the Bees, which must certainly be the only way of ordering of them; because 'tis impossible for them to live if you deprive them of their Food; and therefore about the latter end of *August* consider with your self what Stalls you will keep, and what you will kill; the best Swarms to keep are those of one or two Years standing; and those of three or four, which by reason of their Swarming the last Summer, are full of Bees, and are the most likely to be the best: but those of that Age which have cast Hives, not being like to continue, are to be taken,

taken, as are also poor Swarms not worth the feeding, and all light Stocks, and such as do not carry out their Dross, and drive away the Drones in good time; also those whom the Robbers easily assault, are to be suspected; and if their Combs be once broken, delay not their taking: and also all Stalls of three Years Old or upward that have mis'd swarming two Years together, especially those that have lain out the Summer before and did not cast the last Summer: for such do seldom prosper; and therefore 'tis better to take them while they are good, than in a vain hope of increase to keep them till they perish. Neither is it safe to trust to any after they have stood five Years and upwards, that have mis'd swarming two Years together, unless it be some special Sort of Bees, which always keep themselves in Heart: such as these may be kept nine or ten Years. Likewise if you have any that are very full of Honey, as some Years some will be, even down to the Stool, one such Stall is worth three or four, and therefore take them in their Season.

Having made choice of your Stalls to be taken, two or three Hours before Sun-setting, dig a hole in the Ground of about nine Inches deep, and almost as wide as the Hive-skirts, laying the small Earth round about the Brims; then having a little Stick slit at one end, and stripp'd at the other, take a Brimstone-match five or six Inches long, and about the bigness of your little Finger, and making it fast in the slit, stick it in the middle or side of the Hole; so that the top of the Match may stand even with the brim of the Pit, or within one Inch of it, and then set another by it dressed after the same manner, if the first be not sufficient. When you have fired the Matches at the upper end, set over the Hive, and presently shut it close at the bottom with the small Earth, that none of the



Smoak may come forth ; so shall you have the Bees dead in a quarter of an Hour.

The Hive being taken and housed, lay it softly on the Ground upon the sides not the Edges of the Combs ; and loosen the ends of the splints with your Finger, and the Edges of the Combs where they stick to the sides of the Hive, with a wooden Slice take them out one after another, and having wiped off the half dead Bees with a Goose-feather, break the Combs presently while they are warm into three Parts.

The Honey which first flows of it self from the Combs is called *Virgin-honey*, (as is also the Honey which comes from the first Years Swarm.) This is the best and finest Honey, being more crySTALLINE and of a finer Taste than that which is squeezed out of the Combs, and so may be kept for particular Uses, or for the making of the finest Mead, for the ordering of which I shall refer you to my Treatise of *English Liquors* ; and shall conclude at present with giving you some Account of the way of ordering of your Honey and Wax, with the Virtues of them, that you may be the more sensible of the Advantages that accrue to Mankind by this small Insect.

When your Combs have run out as much as they will, put it up warm into Pots by it self ; this being the finest Honey, as I said before ; and it will for two or three days time work up a Scum of course Wax, Drofs, and other stuff, which must be taken off. The other Honey which is the courser Sort, you must get from the Combs, by pressing of them, which you may Pot also, except what you design for the present making Metheglin with ; which being done, what remains put into a Hair-bag and wash in a Trough or other Vessel to make Meed or Metheglin ; and when the sweetness is all washed out, being crushed dry, the Balls try for Wax. The



The manner of ordering of which is as followeth:

Take the Wax and Dross, and set it over the Fire in a Kettle, or other Vessel that may easily contain it, and pour in so much Water as will make the Wax swim, that it may boil without burning, and for this reason while it is gently boiling over the Fire, stir it often; when it is thoroughly melted, take it off the Fire, and presently pour it out of the Kettle into a Strainer of fine thin Linnen, or of twisted Hair ready placed upon a Screw or Press, lay on the Cover and press out the Liquor (as long as any Wax comes) into a Kettle of cold Water, but first wet both the Bag and the Press to keep the Wax from Sticking: at the first cometh most Water, at the last most Dross, and in the middle most Wax.

The Wax growing hard make it into Balls, squeezing out the Water with your Hand. Which when you have done, break all the Balls into Crums, and in a Kettle or Skillet set it over a soft Fire: While it is melting stir it and skim it with a Spoon wet in cold Water; and as soon as it is melted and scummed clean, take it off, and pour it into a Pan or Mould, besmearing the bottom and side, first with Honey (the Wax being as cool as it will run thro' a Linen Strainer:) when you come near the Bottom, pour it gently, till you see the Dross come, which strain into some other thing by it self: and when it is cold, either try it again, or (having pared away the Bottom) keep it for use.

When the Wax is in the Pan or Mould, if there is any Froth remaining on the Top, blow it together at one side, and skim it off gently with a wet Spoon. This done, set not the Cake abroad where it may cool too hastily, but put it in a warm House not far from the Fire; and if it be a large Cake, cover it warm to keep the Top from

from cooling till the inward Heat be allay'd, and so let it stand, not moving of it till the Cake be Cold: if it stick, a little warming the Vessel or Mould will loosen it; so that it will presently slip out.

The Properties of good Wax are, that it is yellow, odoriferous or sweet, fat, fast or close, light, pure, being void of any other matter. 'Tis always a ready Money Commodity, especially *English Wax* which is much better than Foreign, and commonly sells for about five or six Pound a Hundred; it being of extraordinary use both in Chirurgery and Physick; beside the use that is made of it for Lights, the clearness and sweetness of which makes it preferr'd before all other Sorts.

As to its Chirurgical or Physical Vertues, 'tis reckon'd a mean between Hot and Cold, between dry and moist, being the Ground of all Cerecloths and Salves, it mollifies the Sinews, ripens and resolveth Ulcers, the Quantity of a Pea being swallowed down by Nurses, dissolveth the Milk curdled in the Breast. It's Oyl is of excellent Virtue to cure Wounds, be they never so large or deep (being before stitched up) in ten or twelve days, at the most, and healeth small Wounds in three or four days, by only anointing the Wound therewith: and applying a Cloth wet in the same stayeth the shedding of Hair, either on Head or Face, by anointing therewith. And 'tis as good for inward Diseases, if you give one Dram at a time in White Wine, it will provoke Urine, help Stitches and Pains in the Loins, the Cold Gout and all other Grievs coming of cold.

Honey is little inferiour, either as to its benefit or usefulness; 'tis of subtil parts; and therefore doth pierce as Oyl, and easily passes the Parts of the Body; it hath a Power to cleanse, and some sharpness withall; and therefore it openeth Obstructions,

Etions, and cleareth the Breast and Lungs of those Humours that fall from the Head: it looseneth the Belly, purgeth the foulness of the Body, and provoketh Urine; it nourisheth very much, and breedeth good Blood; it prolongeth Life, and keepeth all things uncorrupted which are put into it; and therefore Physicians do temper therewith such Medicines as they design to keep long. 'Tis good for such as have eaten Mushrooms, or drunk Poppies; it's an eminent Ingredient in the great Antidotes of Treacle and Mithridate, and is good against Pleurifies, Phthificks, and other Diseases of the Lungs. But 'tis for any Distemper much better to be taken clarified than raw, it being thereby made more nourishing, lighter of Digestion, and less laxative, as also less sharp, &c.

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Chap. XX. *Of Silk-worms.*

**S***ilk-worms* are another Insect of great Advantage to the Farmer in other Countries, and might certainly be so in this Island; as well as in *New England, Virginia*, and even *Barbadoes* and *Jamaica*, without hindrance to any of their other Affairs. In *England* the great Obstacle seems to be the want of Food for them. Mulberry Leaves being the only Food that I believe will Feed and Cherish them to advantage, tho' some have affirmed, That they will eat White-thorn, Lettice, Dandelion, Poplar, Plumb and Apple-tree Leaves, the certainty whereof I shall leave to be decided by Experience. Of Mulberries there are two Sorts, the Black and the White; the former sort is the usual Sort given to them in *England*: but the White is most esteemed in Foreign Parts, there being very large Plantations of them raised for that purpose in all the Silk-Countries: it's Leaf is much



much finer than that of the Black, and therefore must be much better for the young Ones. I am apt to believe it nourishes them much better than the Black : but about the ordering of this Tree see my *Treatise of Trees* following.

About the beginning of *May* when the Mulberry begins to spread its Leaf is the time that the Silk-worms Eggs are, as it were by Nature, adapted for a release from their Confinement. At which time, and not before, lay them in some Window in the warm Sun, or carry them in a little Box between some pieces of Say, in some warm place about you, keeping them warm in the Night, they will soon appear. And when they are come out of the Shell, cut some Paper full of small Holes, and lay over them, and over that some of the Young Mulberry Leaves, and they will easily find their way to their Food. After they are come to feeding, you may place them on Tables or Shelves at convenient distance according to the number of Worms that you have.

They are Sick four times in their feeding, the first commonly about twelve days after they are Hatched, and from that time to the end of every eight days, according to the Weather, and their good or ill Usage ; during the time of their Sicknes, which lasteth two or three days, you must Feed them but very little, only relieve such of them as have past the Sicknes before the rest, and those that shall not fall into their Sicknes ; at this time they grow clearer, shorter and thicker than they were before, and more drowsie.

*Time of  
Feeding.*

The whole time of their feeding is about nine Weeks, during which time you may feed them twice a day by laying the Leaves over them as it were to cover them, and they will soon find their way through them ; and as they grow in strength and bigness, so may you feed them more plentifully and



and often. It is good to let the Leaves be clear of Dew or Rain before you give them unto the Worms; you may keep them spread on a Table in case they be wet, you may gather and keep them two or three days without any great inconvenience, and in case you live remote from Mulberry-trees, or the Weather be changeable.

You must observe to rid your Shelves often of *Cleansing* their Dung, and the remainder of your Leaves, by *of them.* removing of the Worms when they are fast on the new Leaves laid them, for then may you remove easily the Worms with the Leaves: keeping clean the Shelves and the Room being the principal means to preserve them. Likewise remember to keep the Room warm in cold and wet Weather, and to give them a little Air in hot Weather.

Let not the Room you keep them in be too near the Tiles on the Top of your House, nor in any cold or moist Room below; but be sure to avoid all extremes.

When they have fed as long as they are able, they look of a clear Amber or Flesh colour, and are then ready to go to work; at which time be sure to give them what Air you can. Therefore 'tis then advised, that you make Arches between their Shelves with Heath made very clean, or with Branches of Rosemary, Stalks of Lavender, or such like: whereupon the Worms will fasten themselves, and make their bottoms, which in about fourteen days are finish'd.

But the best way is to make small Cones of Paper, and place them with their sharp end downward in Rows, in each of which put a Worm as they appear to you to be ready to go to work, and there will they finish their bottom more compleat, and with less waste than any other way.

In their working the first day they make only a Web; the second, they in this Web form their Cases,

ses, and cover themselves all over with Silk, the third day they are no longer seen, and the days following they thicken their Cases, always by one end or thread which they never break off themselves. Let them not any ways be disturb'd in their work, that all the Silk in their Bellies may come out.

When they have finish'd their bottoms, which will be in about fourteen days; take so many as you intend for Breeders, and lay by themselves, *viz.* the first done, and them that are the hardest, reddest, and best coloured must be chosen, and likewise as many Male as Female Cases (which are discerned by this, that the Males are more pointed at both ends of the Cases, and the Females more obtuse at the ends, and bigger bellied) and that no Cases be taken, but such as you may hear the Worms roll in: and then the Worms within will eat their way out in four or five days time; and when they come forth 'tis advis'd to put them together on a piece of old Say, Grogam, Velvet, whited brown Paper, or the like, and put into a Paste-board Box, where they must be kept till next Spring; one of these Females will produce two or three hundred Eggs: so that a few kept for Seed or increase is sufficient. The rest that you do not preserve for breed, put into an Oven, after the baking of Bread, that it may be hot enough to kill the Worms, for the gnawing of their way out, is some prejudice to the bottom. Those that are the grossest and blackest are the best to breed on. Care must be taken, that no Rats, Mice, Ants or other Vermin, nor yet Hens or Birds come at them, because they are very greedy of them, and also Tobacco smoak kills them.

The Worms will come forth in the Form of a Butterfly, having four Wings, six Feet, two Horns, and two very black Eyes, which being put into a

con-

convenient Place, the Males fluttering with their Wings will couple with the Females after that these have first purged themselves of a kind of reddish Humour by the Fundament ; in which Posture they are to be left from Morning (which is the ordinary time of coming forth) till Evening, and then the Females are to be gently pulled away, nine or ten Hours being the longest they should be left together : whereupon they will lay their Eggs, having first let fall another Humour esteemed to proceed from the Seed of the Males : but the Males are then to be thrown away as useles.

The Seed or Eggs at first coming out is very White, but in a day or two it becomes Greenish, then Red, and at last by little and little Gray, which colour it retains always after.

When you have obtain'd your bottoms, take off the Bags, and having found their end, put six, ten or more ends in a Bason of Water together where a little Gum Tragacanth is mix'd, and so you may easily wind them, the small Hairs of Silk seldom break : but if they do, they are easily found again, except the Worms are ill fed : then the Silk is small and easily breaks.

Another way to make these gummy Bottoms wind easie is this, take Soap-boylers Liquor or Lee which is very sharp and strong, and put your Bottoms therein, setting them over the Fire, till the Liquor be scalding hot, and let the Bottoms remain therein about half a quarter of an Hour till the Gumminess be dissolved, then put the Bottoms into clean scalding Water, and let them lie a while therein and they will easily unwind. A Lixivium made of Wood-ashes very strong will do as well as the aforesaid Soap-boylers Liquor.

There is a kind of Tow or rough Sort of Silk that will not wind up with the other, which may be prepared, and good Silk made thereof, and in-  
different



different also of the Bags themselves, but the finest of the English Silk may compare with that of the finest Sorts of any part of the World.

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### Chap. XXI. *Of Fish-ponds.*

**F***ish-ponds* are no small improvement of watry Boggy Lands, many of which are fit for no other Use; nor is there less profit in making of them in Bottoms between rising Grounds, tho' they are dry Lands, if we consider the usefulness of them for the watering of Cattle, and the keeping of Fish, the Advantage of which, both for the House and Market, few are sensible of, it being a profit that comes in without any Charge, expence or labour, and likewise the benefit that there is in stopping of the Floods that fall from the Uplands, so as to cause the Washings of the Dung to settle at their bottoms; there being nothing that is a greater Improvement of Sandy or Gravelly Land than Mud produced by the Washings of the upper Grounds.

In making of a Pond, let the head of it be at the lowest part of the Ground, and the Trench of the Flood-gate or Sluce have a good fall that it may not be too long in emptying. The best way of making the head secure is to drive in two or three rows of Stakes above six Foot long, at about four Foot distance from each other, the whole length of the Pond-head, whereof the first row must be ramm'd at least about four Foot deep, that they may stand strong and sure; or if you find the bottom any thing false, especially if it consist of a running Sand, you may besides lay the Foundation with Quick-lime, which slacking will make it as hard as a Stone. Some lay a Layer of Lime and a Layer of Earth, which is a very great Advan-

tae



tage in the making of the heads of Ponds, Mill-damms, &c. And then diging your Pond, carry the Earth, and cast it among the Piles and Stakes, and when they are well covered over, drive in another row or two as you see occasion over them, ramming in the Earth in the void Spaces, that it may lie close, and keep in the Water : and so you must continue Stakes upon Stakes, ramming in the Earth till the Pond-head be of the height you design it : The inside of the said Damm must be very Smooth and Streight ; and if 'tis made very sloaping on each side 'tis the better, leaving a waste to carry off your waste Water in times of Floods or Rains. The depth of your Pond should be about six Foot of Water at the deepest part, and if on the sides are some Shoals for the Fish to Sun themselves in, and to lay their Spawn on, it will be of advantage to your Ponds, as will likewise the having in other places Holes, hollow Banks, Roots of Trees, Islands, &c. for retiring places for your Fish.

When you have finish'd your Pond, and let in the Water, you may store it with Carp and Tench, which do the best together of any Fish, all other Fish being devourers of their Spawn. But I think, that if you have variety of Ponds, 'tis better to keep all Sorts of Fish by themselves ; except you store a Pond with Fish of Prey, as Jacks or Perch, and then you must put in Roach, Dace, Gudgeons, or other very increasing Fish for them to feed upon : but not a Tench, as most Authors propose. For a Jack or a Perch will as soon, if not sooner, seize on a Tench, than any other Fish, as I found by experience in a Pond of mine that a Pike got into by chance.

Gravelly and sandy Bottoms, especially the latter, are the best breeding Ponds ; and a fat Soil with a white fat Water, as the washings of Hills,

Commons, Streets, Sinks, &c. is the best to fatten all Sorts of Fish ; an instance of which I met with from a Gentleman in *Nottinghamshire*, that had a small Pond at the bottom of a Hill, upon the side of which was a small Village, above which was a very good Spring that run thro' the middle of the Town, and met with all the Sinks and other Drains belonging to the Houses, which it constantly (being a very large Spring) carried into the Fish-pond that was below the Hill, where my Friend assured me, that he had often put in Carps of four or five Inches long, that in a Years time grew to the length of eighteen Inches, which was confirm'd to me by several of his Neighbours, as well as himself; whereas the ordinary growth of a Carp is not above two or three Inches in that time. Only where such Floods are too violent, it may be good to carry some part of them on one side of the Pond, that they may not carry away the Fish; Carp being very apt to float away with fresh Water.

For storing of your Pond, Carp is to be prefer'd for their goodness, quick growth, and great increase, they breeding five or six times in a Year. But as the Female is eight or nine Years old before she breeds, you must take care constantly to keep a good stock of Females of that Age in your Ponds, if you desire a breeding Pond; indeed the Females should never be killed, because they are often very apt to die after their Spawning. The Male Carp must be three or four Years old, and to every Female you may in a Pond that breeds well, put from three or four Males to a dozen or more.

A Pond of an Acre of Land if 'tis a feeding, and not a breeding Pond, will every Year feed well two hundred Carps of three Years old, three hundred of two Years old, and four hundred of a Year

Year old. Carps delight in Marl-pits, or Pits that have clean clay bottoms, new Ponds or old Ponds, full of Weeds, that are warm and shelter'd from the Winds, and that have Grass growing at the bottom or sides, whereon they feed in hot Months. Carp and Tench thrive also mightily in Ponds or Ditches near the Sea, where the Water is a little Brackish: but they do not eat so well as in clear Water. If Grains, Blood, Chickens Guts, &c. be flung into a Pond, it will much help to fatten the Fish, and to increase their growth. If you cleanse a Pond of Weeds, do it at the fall of the Leaf and not in the Spring, because it rather increases than diminishes them.

Your Pond should every three or four Years be drain'd, and your Fish sorted; if 'tis a breeding Pond, you must take out the smaller ones to store other Ponds with, that you may not starve the great ones, which a great stock of small Fish in a Pond is apt to do. And therefore in feeding Ponds 'tis best to keep them pretty near of a Size.

Ponds made at the Head of a Chalky Spring are very good for *Trouts*, who will mightily thrive in them. *Flounders* will both thrive and breed in any Pond, and especially Clay Ponds, and grow much larger than those in Rivers.

All Sorts of Bitterns, Herons, Sea-Gulls, Kings-fishers, Water-Rats, Water-Mice, Otters, &c. are very great Enemies to Fish, and therefore should be destroyed, as much as you can; but the greatest Destruction of Fish in Ponds, is occasion'd by the Frost, to prevent which some propose to break the Ice, and to lay in Pipes, Straw, &c. to give Air to the Fish, all which ways I have found to fail when my Ponds have been foul: but when clean, I have preserv'd them without using of any of these ways; wherefore I cannot but think that 'tis the foulness of the Ponds only that stencheth

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the Water: and therefore (not only for the Preservation of Fish, but because it much helps their breeding and feeding, by affording of them Earth to feed and lay their Spawn on) I would very often have Ponds cleansed; the Mud whereof doth commonly more than pay the Charge, where you have a good bottom to cast it out on; but as 'tis much more chargeable and troublesome to get out in boggy and springy Bottoms, where you cannot Cart it; so I shall advise that all Ponds made in such Places, should be made like Moats, and not broad Ponds, that so when ever you have a mind to empty them, the Workmen may at one or two throws at the most be able to cast the Mud out on the Banks, for the Price of which Sort of Work, every Pole-square of Mud that is twelve Inches deep is worth Six-pence a Pole to fling out where it may be done at one throw; but where two is required 'tis worth Twelve-pence a Pole, &c.

Having thus given you an Account of the beneficial part of Husbandry, I shall next proceed to the Consideration of several things that are injurious to the Husbandman, with their Remedies.

## BOOK VII.

### Chap. I. *Of things prejudicial to the Husbandman.*

*Heat and drought.*

**G**REAT Heats and Droughts are often very prejudicial to the Farmer, in that they exsiccate and waste the moisture and vegetative Nature of the Earth, so that in a dry Year most of our Commons, or open Field Land yield but indifferent Crops either of Corn or Grass: and tho' dry Summers are the most plentiful of  
Corn,



Corn, 'tis because we have so much low Ground and inclosed Lands that are defended from the scorching Heats of the Summer Air; the only remedy to prevent which, are tall Inclosures and plenty of Water: The *First* of which we have given Direction about in the Methods proposed for the planting and ordering of Trees. But the *Second* in many Places is more difficult to remedy, tho' 'tis what may be many ways effected, as

*First*, By sinking of Wells, which where they are very deep, makes it very troublesome and chargeable to raise the Water.

*Secondly*, By bringing the Water in Pipes, Gutters, &c. which is easily done where the Spring or Stream from whence you bring it, is higher than the place where you desire to have it.

*Thirdly*, By raising of the Water with Pumps, Water-wheels, &c.

*Fourthly*, By making of Cisterns or Receptacles for Water, for either the Rain or Winter-springs to fill, in which the Water may be kept throughout the Summer.

In which sort of Contrivances we are very deficient. For in the mountainous Countries of *Spain* they have no Water but what they get this way. Also in *Amsterdam* and *Venice* they keep Rain-water in Cellars made on purpose for Cisterns capacious enough to contain Water for the whole Year, it being renewed as often as the Rain falls. Therefore the being put to such difficulties for the watering of Cattle, and other Inconveniences for want of Water, as many are in several places, is the effect of our want of Industry and Care, much more Rain falling here than on the Continent where these Pools and Cisterns supply all their Wants for their Houses, Cattle and Gardens: and yet we have thousands of useless Acres for want of so easie a Remedy.

*Cisterns.*

If you design to make your Cisterns under your House, as a Cellar, which is the best way to preserve it for culinary Uses, you may lay the Brick or Stone with Terrace, and it will keep Water very well: or you may make a Cement to join the Bricks or Stones with, with a Composition made of slacked sifted Lime and Linseed Oyl tempered together with Tow or Cotton-wool. Or you may lay a Bed of good Clay, and on that lay your Bricks for the Floor, then raise the Wall round about, leaving a convenient space behind the Wall to ram in Clay, which may be done as fast as you can raise the Wall: so that when it is finish'd, it will be a Cistern of Clay walled within with Bricks, and being in a Cellar, the Bricks will keep the Clay moist ( altho' empty of Water ) that it will never Crack. This I have known to hold Water perfectly well in a shadowy place, tho' not in a Cellar. Thus in Gardens or any other places may such Cisterns be made in the Earth and cover'd over, the Rain-water being convey'd thereto by declining Channels running unto it, into which the Alleys and Walks may be made to cast their Water in hasty Showers. Also in or near Houses may the Water that falls from them be conducted thereunto.

But the usual way to make Pools of Water on Hills and Downs for Cattle, is to lay a good Bed of Clay near half a Foot thick; and after a long and laborious ramming thereof, they lay another course of Clay about the same thickness, and ram that also very well; and pave it very well with Flints or other Stones, which not only preserves the Clay from the tread of the Cattle, &c. but from chapping by the Wind or Sun at such time as the Pool is empty. Note also, That if there be the least Hole or Crack in the bottom, it will never hold Water, unless you renew the whole labour;

bour ; or you may make a Cistern or Pool to hold Water by daubing of it with Clay and Mortar, and after draw it over with Mortar ; if any cleft happen, stop it with a Cement of clean Hair and Tallow mix'd with unslack'd Lime and Yolks of Eggs well beat, and made into Powder, and mix'd well together. I am told that in *Wiltshire* upon the Top of the dry chalky Hills where there is any descent to catch the Water, they make Ponds, the bottom of which they cover with Chalk Rubbish, which they beat small, and when any Rain comes to moisten it, they ram it well, and drive Cattle into it, and fold Sheep on it to trample it, and it makes it hold Water.

Heat and Drought do not always attend us, nor do they so frequently afflict us, especially in the greatest Part or Proportion of this Country, but that we have also a share of a super-abundant Cold and Moisture. The Cold that most afflicts the Husbandman, is the bitter Frosts that sometimes happen in the Winter or Spring, and are beyond our Power either to foresee or prevent ; yet that they may not injure us so far, as otherwise they might, we shall propose the following Remedies or Preventions.

*Great Cold.*

Some Lands are more inclinable and capacitated by their Nature or Situation to suffer by cold or wet, than others are ; as those that lie on a cold Clay or Chalk, more than those that lie on a warm Sand or Gravel ; those that lie moist, than those that lie dry ; and those that lie on the North or East sides of Hills, than those that lie on the South or West : therefore 'tis good to plant or sow such Trees, Grains or Plants that can least abide the cold, in such Grounds as are more warmly situated, as I observed before.

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And



And tho' 'tis not an easie thing to alter the Nature of the Ground, yet 'tis feasible to take away the offensive moisture, that doth so much cool the Land, as I have shewed before in the *methods used for draining of Grounds*: and also to place such artificial Shelters against the Cold, as may very much remedy this inconvenience; as we see 'tis most evident, that Frosts have a greater influence where the Air hath its free Passage, than where it is obstructed; for which end, Inclosures and planting of Trees, &c. are a great Preservative, especially such Inclosures as are made in *Cornwall* and *Devonshire*. The Bank-fence is likewise a good shelter for the Land and the Cattle.

¶ *Wet.*

And though great Rains and too much wet prove injurious to such Lands as are of themselves moist and flat, as I said before: yet the greatest Injury they do to the Husbandman is in Harvest-time, against which the best Remedy is Expedition.

Worthy of Commendation is the Practice used in several places of laying up their Wheat-sheaves in very large Shocks or Heaps in the Fields, so as to abide any wet. The manner of doing of this I have already describ'd. Whereas in other places they leave all to the Weather, (tho' their Land lie remote from Barns,) to their very great Damage. So much are some People guided by the Custom of the Place, rather than their own Reason.

Where Lands lie two or three Miles from the Owners Barns, as in some places in *Champaigne Countries* they do, the cover'd Reek Staval (much in use Westward) must needs prove of great advantage in wet Harvests.

Where Lands lie at a far distance one from another, several Barns built, as the Land requireth, are very Convenient for the more speedy housing of Corn, for the better preserving of it, the more easie thrashing it out, the more Convenient to-  
thering



thering of the Cattle with the Straw, and for the cheaper disposing of the Soil for the Improvement of the Land, as is practis'd in the Clay Countries of *Suffex*, where their Gate-ways between their Inclosures are so miry (they having no Gravel to mend them with) that they cannot (except it be a dry Summer) Cart between one Field and another. For which reason a Farm of fifty Pound *per Annum*, hath commonly two, if not three Barns, belonging to it; with as many Cow-yards to fother Cattle in, adjoining, to prevent carting of their Corn, Dung, Fodder, &c. whereas a great Barn cannot lie near to every part of a large Farm, and the Corn must be more expos'd to the wet in a rainy Harvest.

High Winds prove very Pernicious and Injurious to the Husbandman in several respects, to his Building, Fruit-trees, Hops, Corn, &c. as many in the plain open Countries find by woful Experience: to prevent which, as to Building, we find by common Experience, that Trees are the only and most proper Safeguard; for which the Yew is the best, although it be long a growing: only 'tis to be observ'd, that the Trees should not be planted so near the Building, as that their fall may any ways indanger them.

*High Winds.*

Timber or other Trees which are also subject to be subverted, or broken by high Winds, to abate the largeness of their Heads by cutting off their spreading Arms, a Yard or so from the Body, proves a good prevention, especially the Elm, which ought often to have its Boughs shred up, or else it will be very subject to be injured by high Winds.

Hops, of any Plant the Husbandman propagateth, receive the most Damage from high Winds, which may in some Measure be prevented against the Spring-wind, which nips the young Buds, and afterward

terward bloweth them from the Poles; a good Pale or Thorn-hedge much advantageth them. But against the boisterous Winds when they are at the Tops of the Poles, a tall Row of Trees encompassing the whole Hop-garden, is the best Security in our Power to give them. Be sure also to let their Poles be firm and deep in the Ground.

As to Corn, Winds sometimes prove an injury to it in the Ear, when they are accompanied with great Rains, by lodging of it. The only remedy is to cut it betimes, and to let it lie long on the Gavel to kill the Weeds, and to harden the Grain, which will never grow nor receive Nourishment after the Stalks are broke, or much bow'd down to the Ground. But the greatest injury is to the Winter Corn when it is young, the fierce bitter Blasts in Spring destroying whole Fields, which nothing is a preventer of but Inclosures.

Blites and Mill-dews have been generally taken to be the same thing, which hath begotten much Error, and the ways and means used for the Prevention and Cure have miscarried thro' the Ignorance of the Disease. For,

*Mill-dews.* *Mill-dew* is quite another thing from blasting, *Mill-dews* being caused, as some say, from the condensation of a fat and moist Exhalation in a hot and dry Summer, from the Blossoms and Vegetables of the Earth, and also from the Earth it self, which by the coolness and serenity of the Air is condensed into a fat glutinous Matter, and falls on the Earth again, part whereof rests on the Leaves of the Oak and other Trees, whose Leaves are smooth, and do not easily admit the Moisture into them, as the Elm or other rougher Leaves do. *Mill-dews* become the principal Food of the Bees, being sweet, and easily convertible into Honey.

Other part thereof rests on the Ears and Stalks of Wheat, bespotting the Stalks with a different Colour

Colour from the natural, being of a glutinous Substance by the heat of the Sun, and so binds up the young, tender, close Ears of the Wheat, that it prevents the Growth, and compleating of the imperfect Grain therein, which occasioneth it to be very light in Harvest, and to yield a poor, lean Grain; for which reason many reckon the bearded Wheat not so subject to it, as the other, the Beards defending of the Ear from it.

Some think Mill-dews to proceed from Vapours arising from the Dung, and so falls upon the Corn: Because Lands new dunged are the most subject to it.

But if after the Mill-dew falls, a Shower succeeds, or the Wind blows stiffly, it washeth or shaketh it off, and these are the only natural Remedies against this Distemper.

Some advise in the Morning after the Mill-dew is fallen, and before the rising of the Sun, that two Men go at some convenient distance in the Furrows, holding a Cord stretched streight betwixt them, carrying of it so, that it may shake off the Dew from the Tops of the Corn, before the heat of the Sun has thicken'd it.

It is also advised to sow Wheat in open Grounds, where the Wind may the better shake off the Dew, this being look'd upon to be the only inconvenience Inclosures are subject unto; but it is evident that the Field-Lands are not exempted from Mill-dews, nor yet from Smut, where it is more than in inclosed Lands.

Some say, that Lands that have been subject to Mill-dews many Years, have been cured by sowing of Soot with, or just after the Corn.

'Tis observable, that after a wet Summer, Corn *blites*. is apt to be *blited*; the reason of which is, that the overmuch Moisture that lies continually at the



the Roots of the Corn, maketh it run much to Straw, and little to Corn; and at such time as the Corn should kern, the moist Vapours, exhaled by the Sun from the wet Ground, do in the Nature of a Mill-dew, prevent the due growth of the Grain in the Ear.

'Tis observ'd, that when these Mill-dews arise, or Blites fall, they infect one Sort of Grain generally, as sometimes only Wheat, sometimes Oats, &c. the like happens among Fruits; sometimes Apples are generally blasted; sometimes only Pears, sometimes only Cherries, Walnuts, Filberts, Plums, &c.

*Smuttiness* *Smuttiness* in Corn happens from very different Causes, to what Mill-dew and Blites do, it being chiefly to be found in dry Summers, and is occasion'd from too much Rankness and Fatness of the Land: It being observ'd, that strong Lands are to be sown with Hemp, Barly, Pease, and such like, to abate the Fertility thereof, before it be sown with Wheat, which would otherwise be subject to Smuttiness.

It is likewise confidently affirm'd, that the sowing of Wheat mix'd with smutty Corn, generally produces a smutty Crop, unless it be steeped in Brine all Night, and then mix'd in the Morning just before sowing, with Lime beat to Powder, which is esteemed a certain Remedy. Only you must observe, that what Corns are light and swim upon the Top of the Brine, are to be scummed off.

You may also prepare your Ground with Lime, Soot, or other saline Manure, and it will produce Corn free from Smut. Dung alone is reckon'd a causer of it, if 'tis laid on just before sowing; and Land often sown with the same Seed, or much out of heart, is subject to Smuttiness, as  
hath

hath been found by Experience, where the same and different Seed hath been sown on two Sorts of Land.

If you have smutty Ears among your Corn, so as to black the rest of your Corn, if you design it for Seed, pick out the black Ears: But if for Sale, you must take it and wash it in two or three Waters, 'till you see all the Blackness quite gone: Which done, drain away the Water clean, and laying the Corn on Cloths or Coverlids, lay it in the Heat of the Sun, and so dry it again, 'till it be so hard that it will grind. But if the time of the Year will not serve for the Sun's drying of it, then dry it on a Kiln, with a very soft, gentle Fire, and cool it in the Air, to recover the Sweetness again, and the Corn will be as serviceable as any other; only for Seed, it will by no means do; and therefore it concerns every Countryman to take heed, that the Corn he buys for that use be not washed.

To know which from other Corn, you may take it up in your Hand; and if the Corn look bright, clear and shining, being all of one intire Colour, you may be sure 'tis unwash'd: But if it look whiter at the Ends than in any other part, and that the whiteness is blackish, and not shining, you may conclude it to be washed Corn.

Again, put three or four Grains in your Mouth, and chew them, and if the Taste be sweet and pleasant, and grind mellow and gently between your Teeth, 'tis good. But if it have a bitterish, raw Taste, and grind hard between your Teeth with much roughness, then hath the Corn been wash'd and dry'd again, and is not good for Seed: also when Corn is more than ordinarily dry, both are ill Signs, and shew either imperfect Corn, or bad keeping: For good Corn always holds an indifferent Temperature betwixt dry and moist, and will  
always

always feel cool and slippery in the running of it. But some say that if Wheat be smutty or Mill-dewed, if in the thrashing of it you mix Barly-chaff with it, it will cure it.

There is much Land in *England* that is capable of very great Improvement, by removing of these common and stubborn Obstacles, as Stones, Shrubs, Bushes, Goss, Broom, &c. which are naturally produced in many places, and are a very great prejudice to Land, by sucking out the heart and fatness of it, or by occasioning a burning Drought upon it. As,

*Stone.*

*Stones*, where they are too thick upon a hot burning gravelly Land, they are of good use to mend ways with, or to lay to the Roots of Trees, &c. being picked up and laid in heaps, and so carried off. But there are some very cold, chalky Clays upon the Tops of bleak Hills much exposed to high Winds and nipping Frost, that the Stones are a Safeguard to the Corn that grows on them, by the keeping of the Roots of it warm in Winter, and sheltering of it by their shade in Summer, from the scorching Heat of the Sun. Some of these Sorts of Lands that the Stones have been carried off, would neither bear Corn nor Grass, till they were carried on again.

*Shrubs.*

*Shrubs* and *Bushes* are very great Annoyances to the Husbandman, the difficulty and charges of pulling them up, being the principal Impediment of their removal, to them that are ignorant the of doing it the most dextrous ways. Where they are tall and grow thick, the quickest way of pulling them up, is to inclose in a Timber Chain as many of them as you can, and to clap to them a Team of Horses, and so to tear them up: And when that Parcel is eradicated, then encompass as many more. But if they are not big enough for this way, or grow too thin, the following Instrument is the



the best for this purpose, and also for Furz, Broom, &c. At A is a long Handle of Wood about four Foot long, at B is an Iron Hook jagged; at C is a little Hook, which they use thus: They put the Handle A a-slope from them and catch the Stem or Stalk of the Broom or Bush they design to pull up in the Hook at B, and from that they bend the Stem to the little Hook at C, this occasions the holding of the Stem that it do not slip, and so setting of



their Shoulders to the upper End of the Handle at D as it stands sloping, they raise up the Bush or Broom; the Price of doing of which, where a Man hath Fourteen-pence a Day, is to pull up a Load of Bushes or Broom which they reckon to contain sixty Faggots for two Shillings, which Faggots being well bound ought to contain four Foot and a half in Circumference: But where the Bushes are short, and grow upon old Stubs, they must be stubbed with a Mattock, the Price of which where the Bushes grow thick is Three-pence a Pole square; but if you will have the Land dug up, that so you may be sure to clear the Land of the Roots, and to kill them, the common Price is Four-pence a Pole, the Owner of the Land having the Bushes and Roots.

Some Lands are much given to the bearing of *Furz*, especially such as are inclining to Sand. Which is destroy'd either by plowing up, burning and mending of it well with Marle, Lime, Dung, &c. or by planting of Acorns among them, which the *Furz* will shelter and shade till they get up above them, and then the Oaks will destroy the *Furz* by dropping on them.

*Furz*

But

*Broom.*

But the most pernicious Plant that grows upon Land is *Broom*, which, as it sheds no Leaves, so 'tis continually sucking the Heart of the Land it grows upon. The only way to kill it, is to pull it up, to plow the Land, and Burn-bate, and Manure it very well with Dung, Ashes, &c. but the only effectual Remedy for it is Chalk and Marle. If you design the destroying it on Pasture Land, 'tis better to cut it up in *May*, when the Sap is in it; because by that means, you kill the Root: whereas if you pull it up, you are apt to leave strings behind, the least of which will grow.

*Broom* if well laid, will make an excellent Thatch for Houses or Barns.

*Ling, Heath, &c.* being much of the same Nature, I shall pass them by, because they are cured by the same Remedies; and only observe that *Heath* in many places being very necessary for Firing where other Fuel is not to be got, the cutting up of the Turf is a very good way to destroy it, especially if the Ashes be laid on the places where 'tis cut off, it being an extraordinary good Manure for Land. The Price of cutting of the Turf is 8 *d.* a Load, five hundred of Turf being reckon'd to a Load.

*Fern.*

Next unto these Shrubs, I think *Fern* one of the worst of Weeds, and 'tis as hard to destroy, where it has any thing of a deep Soil to root in. I have seen the Roots of it in some Grounds, eight Foot deep. The best cure is often mowing of it while in Grass. If you plow it up, plentiful dunging of it and Ashes are very good: but the certaintest cure for it is Urine. *Fern* cut when the Sap is in it, and left to rot upon the Ground, is a very great Improver of Land: if burnt when so cut, their Ashes will yield double the Quantity of Salt, that any other Vegetable will do. In several

veral places of the North they mow them green, and burning of them to Ashes, make the Ashes up into Balls with a little Water which they dry in the Sun, and use them to wash their Linen with, for which use they esteem it near as good as Soap.

*Thistles* are a great Annoyance to some Land, by *Thistles* killing the Grass, Corn, &c. altho' they are a sure token of the strength of the Land. The way to destroy them is to cut them up by the Roots before feeding time, that they may not by their flying Seeds increase themselves.

*Rushes, Flags,* and such like Aquaticks are best *Rushes* destroyed by draining; if that you cut your Drains below the Roots thereof, that they may take away the matter that feeds them, and by laying of Ashes or Soot on them, and also by plowing of them up, and laying of the Land in high Ridges to drain it, and by mowing.

*Twitch-grass* is a very pernicious Weed to some *Twitch-* Land, by keeping of it loose, hollow, and by draw-*grass.* ing away the virtue of the Ground, to the prejudice of the Corn sown upon it, it bespeaks the Land to be of a cold, fowre Nature; the best remedy is good fallowing in dry Weather, and harrowing it well, with good manuring of it with Lime, Dung, Ashes, Chalk, &c. White Oats are likewise a good Seed to sow on such Land, because they are sown late, and come up quick to over-top it. Burn-bating of this Land is an effectual way also of destroying it.

*Goose-grass* or *Wild-tansie* is a Weed that strong *Goose-* Clays are very subject to. The best cure of which is *grass.* mowing of it in Summer, and well dunging of the Land, and never to plow the Land out of heart.

*Green-weed* or *Wood-wax*, if cut while green and made Hay of, Sheep will eat in Winter.

Some Lands are more prone and subject to Weeds, and that in some Years more than others:

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for the destroying of which in Corn-Lands, the laying of them dry, and good fallowing is the best Remedy : but for Pasture-land, sometimes mowing is good. Soot and Ashes, especially upon cold Lands, or Lands run over with Moss, are an extraordinary Improvement.

*Foxes.*

The *Fox* is a Beast also very prejudicial to the Husbandman, by taking away, and destroying of his Lambs, Poultry, Geese, &c. especially in places that are near great Forest-woods and covert places. The best way for destroying of them is with Guns, or Traps, after this manner ; if you design to shoot them, procure a Sheep's Paunch, and tying of it to a long stick rub your Shoes well upon it, that the Fox may have no scent of your Feet, and draw the Paunch after you, with which make a Trail a Mile or two in length ; which order so as to bring it near some thick headed Tree. At which place when you have made your Trail, leave your Paunch, and with your Gun get up into the Tree ; and as soon as it begins to be dark, you will see him come by you, upon the scent of the Trail, where you may shoot him. Observe, that you draw the Trail to windward of the Tree, if you can.

But if you have a mind to catch them with a Steel-trap, which is the surest way ; chuse a place to set it, in a plain part of a large Field ; let it be out of the way of all Paths, but not near either a Hedge or any shelter. Open your Trap, and lay it upon the Ground, and cut out in the Turf just the form thereof, and take out so much Earth as may make room to lay it, covering of it again very neatly with the Turf you cut out ; and because the joints of the Turf will not close exactly, get some of the fine Mould that is to be found in a new cast up Mole-hill, and fill the joints with it, taking some Grass, and sticking of it in the Mould,

Mould, as if it grew there. Make all so fine and plain, as that it may deceive your own Eye to look upon it. About eight or ten Yards from the Trap three several ways, scatter some of the fine Mould that you had out of the Mole-hill, very thin, upon a place about fourteen or fifteen Inches square: and upon these places, and where the Trap is, lay two or three small bits of Cheese, and with a Sheeps Paunch, as is before directed, draw a Trail of about a Mile long, to each of the three places, that are at a distance from the Trap, and from thence to the Trap, that so the Fox may come upon one of those places first, which will make him approach the Trap with the more boldness, where you will seldom fail of him, only you must observe not to fasten your Trap, but to leave it loose, that he may draw it to the Hedge-side, or to some Covert, or else he will bite off his Leg, and be gone.

Some bend down a Stick in the Wood, and set a Trap for them in their Paths, like that which is set for Woodcocks, which hangs them up, or any other sort of Vermine.

*Badgers* are almost as pernicious a Beast as the *Badgers.* Fox, only they are not so subtil, nor can they so easily catch their Prey: but for what they can catch, as new fallen Lambs, young Pigs, and Poultry, they are as bad. The way to catch them is with the aforementioned Trap, or to set a Steel-trap, or to dig a pit in their Paths that is five Foot deep, and about four Foot long, making of it narrow at the top and bottom, and wide in the middle. This must be covered with some small Sticks and Leaves laid over it, so as that the Badger may fall in when he comes upon it. Sometimes a Fox may be caught in one of these pits; but 'tis very rare; for he is very cautious of his footing. Some hunt them into their holes in a Moon-shine Night, and dig them out.

*Otters.*

*Otters* are very great destroyers of Fish, especially in Ponds, to which they will in a Night travel over Land ten or twelve Miles; their common abode is under the Root or Stem of some Tree near the Water. Whence she expects her Food by her diving and hunting under Water: so that few Fish are able to escape her. They are either taken by snaring them under the Water by the River-side; or by hunting of them with Dogs, where you may make use of the Spear.

In several places the Husbandman suffers much by *Hares* and *Coneys*, which eat the Corn, Trees, &c. when they are young, especially in hard Winters.

*Hares.*

The *Hares* are great destroyers of Corn; where there are many of them, the Countryman may lessen the number of them as he sees cause, either by hunting or coursing of them at seasonable times, or by tracing them in the Snow.

*Coneys.*

*Coneys* are destroy'd or taken either by Ferrets or Purse-nets in their Burrows, or by Hayes, Curs, Spaniels or Tumblers bred up for that purpose, or by Gins, Pit-falls, or Snares.

*Poll-cats*, *Weefels* and *Stoats*, do a great deal of injury to Warrens, Dove-houses, Hen-roosts, &c. but the way of taking them in Hutches, Iron-traps, &c. are so well known, that I need not say any thing of it.

*Poll-cats.*

To prevent *Poll-cats* or such like from destroying your Pigeon-house, if you have a conveniency, place it in an Island where you may have some Ditch or Chanel of Water round it, and it will preserve it from Vermin; there being scarce any Beast of Prey that will take the Water.

*Moles.*

*Moles* are a very pernicious Enemy to Husbandry, by loosening of the Earth, and destroying the Roots of Corn, Grass, Herbs, Flowers, &c.



In the Southern parts of *England*, their usual way of destroying of them is by Traps that fall on them, and strike sharp Tines or Teeth through them; which are so common, that they need no Description.

The best sort of Trap is made after this Fashion. Take a small board of about three Inches and a half broad, and five Inches long on one side thereof; raise two small round Hoops or Arches, one at each end, like unto the two end Hoops or Bails of a Carrier's Waggon, capacious enough for a Mole to creep through easily; in the middle of the Board make a Hole about the bigness of a Goose-quill, for to put into which have a short Stick about two Inches and a half long; one end of which must be fitted to the said hole, and the other a little forked. Also you must cut a Hazle, or other Stick about a Yard or a Yard and half long, that being stuck into the Ground, may spring up. Then make a link of Horse-hair very strong, and that will easily slip, and fasten it to the end of the Stick that springs. Have also in readiness four small hooked Sticks, and go to the furrow or passage of the Mole, and after you have open'd it, fit in the little Board with the bended Hoops downward, so that the Mole when she passes that way, may go directly through the two semicircular Hoops. But before you fix the Board downward put the Hair-string through the hole in the middle of the Board, and place it round, that it may answer to the two Hoops, and with the small Stick (gently put into the hole to stop the knot of the Hair-spring, but not enter'd too far into the hole) place it in the Earth in the Moles passage, and by thrusting in the four hooked Sticks, fasten it, and cover it with Earth; and when the Mole passes that way, (either the one way or the other,) by displacing or removing of the small Stick that hangs perpendi-

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cularly

cularly downwards, the knot passing through the hole, the Spring takes the Mole about the Neck.

Others destroy them with a Spaddle, waiting in the Mornings and Evenings for them; at which times they usually stir, and immediately cast them up, especially about *March*, when they breed, by turning up the Hills that they breed under, they usually making their Nests in the greater Hills, which are easily discern'd. Then also will the old ones come to seek their young, which you may presently take.

The Pot-trap is by some much commended, which is a deep Earthen Vessel set in the Ground with the brim even with the bottom of the Mole-tracts; the chief time of setting of which is in their Bucking time, which is in *March*.

Also where Moles annoy your Gardens, Meadows, or such places as you are not willing to dig, or break much, the fuming of the holes with Brimstone, Garlick, or other unfavoury things, will drive them out of the Ground that was before infested with them; and the putting of a dead Mole into a common haunt, will make them absolutely to forsake it.

## Chap. II. *Of Mice and Rats.*

*Mice and  
Rats.*

EVERY one is sensible of the great Injuries these Vermin do both in the Field, and where they raise Nurseries of Trees, in their Gardens, where they sow and plant Beans, Pease, &c. and in their Houses, Barns, and Corn-ricks.

In the Fields, Orchard, Gardens, &c. the common way of catching of them, is by placing of an Earthen Pot in the Ground about half full of Water, which they cover with a Board with a hole in the middle thereof, and cover the Board  
with

with Hawm, Straw, or such like Rubbish, under which the Mice seeking for Shelter, creep into the holes where they find the Pot ready to receive them.

Some place three Sticks in the form of a Figure of 4, which they bait with a piece of Cheese, and upon it lay a Tyle, which falling down when they touch it, kills them: this is a very good Trap for to catch them with in Gardens and Orchards, and such like places.

In *Staffordshire* they put Birdlime round the holes, which the Mice and Rats run through in their Houses, Barns, &c. which, they say, sticks so to their Skins, that they will never leave scratching till they kill themselves.

Some strew Sand amongst their Corn, which, they say, prevents their burrowing in it; because of its falling into their Ears.

As for the making of Stavals, Granaries, Barns, &c. that the Mice and Rats cannot come at the Corn that is in them, I have already given you directions.

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### Chap. III. *Of Kites, Hawks, &c.*

**K**ites, Hawks, and other Birds of Prey, wait for Pigeons, Chickens, Pheasants, &c. for which reason 'tis necessary that the Countryman be constantly provided with a good Fowling-piece to destroy and scare them away.

Also you may place small Iron-gins about the breadth of ones hand made like a Fox-gin and baited with raw Flesh, which is a very good way to catch them.

Also by straining of Lines or pieces of Nets over the places where you keep Chickens, Pheasants, or such like, you may fright them away.



*Crows, Ravens, Rooks and Magpies* are great annoyances to Corn, both at Seed-time, pulling of it up by the Roots whilst it is young; and feeding on it also at Harvest: a good Fowling-piece is the best Instrument at present; but the only way to destroy the Kind of them would be some publick Law to encourage the Destruction of their Nests and Young, which are so obvious at their building time, that it seems to be a very easie work, and much better than any other way.

Several inventions of Scare-crows there are to keep them from Corn, amongst which this is esteemed the most effectual, *viz.* To dig a hole in some obvious place where the Crow, &c. annoy your Corn; let it be about a Foot deep or more, and near two Foot over, and stick long black Feathers of a Crow or other Fowl round the Edges thereof, and some at the bottom: several of these holes may be made, if your Ground be large; and where these holes are thus dressed, the Crows will not dare to feed.

Dead Crows, &c. hanged up do much terrifie them; but amongst Cherry-trees, and other Fruit Trees, which are much prejudiced by them, draw a Packthread or small Line from Tree to Tree, and fasten here and there a black Feather, and it is sufficient.

*Pigeons* are a very pernicious Fowl to the publick, and bring but little profit to the Owners (that I could ever find) where they must be fed in Winter and at Benting time, which you must do in all places, except the Clay Countries where they sow great Quantities of Gray-pease and Horse-beans, which are sow'd forward in the Year, as I shew'd before.

The only way to get rid of them, is to affright them with shooting Powder at them, and to hang up Feathers in Lines as was before directed for Crows and other Birds.

*Jays*

*Jays* are great devourers of Beans, Pease, Cher-  
ries, and other Garden-Fruits; but are easily  
met withall, if you are watchful in a Morning ear-  
ly, by lying in Ambush for them, sometimes chang-  
ing your place, lest they discover you: but if they  
do, they commonly make but short Flights as it  
were from Tree to Tree, so that you may easily  
pursue them where you have any thing of shelter  
to get behind.

A very good way to take them, is to drive a  
Stake into the Ground about four Foot high a-  
bove the Surface of the Earth; let the Stake be  
made picked at the top, that the Jay may not set-  
tle on it, and within a Foot or thereabouts of the  
top of the Stake, bore a hole through about three  
quarters of an Inch Diameter, fit a Pin or Stick  
to the hole about six or eight Inches long, and  
make a Loop or Spring of Horse-hair fastned to a  
Stick or Wand of Hazel that may be entred into  
the Stake at a hole near the Ground, and by bend-  
ing of the Stick up put the Loop of Horse-hair  
through the upper hole, and put the short Stick a  
little way into the hole, and lay the Loop round  
on the short Stick, that the Jay when he comes  
may find this resting place to stand conveniently  
amongst his Food, so as that when he pearches on  
the short Stick he may by his weight cause it to  
fall which will give the Spring the Advantage of  
catching the Jay by the Legs. This is a very good  
way of taking of them, if 'tis placed amongst  
Beans, Pease, or such things as the Jay haunts, it  
being their usual Custom to hop from Tree to Tree,  
or any thing they can meet withall.

*Bullfinches* are most pernicious Birds to young  
Fruit-Trees, by feeding on the young pregnant  
Buds in Spring time which contain the Blossoms,  
and are the only hope of the succeeding Year.

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If *January* prove very cold, that the *Black-thorns* are backward in *February*, the *Bullfinches* will be very busie in the Garden. The Trees there growing being forwarder than in the Field in a cold Winter. I have known so many of them in a Garden, that in a little time they have almost totally unbudded the Plum-trees, Currant-trees, &c. of a whole Town.

They are easily taken off with a Fowling-piece, only you must be cautious that your Shot spoil not your young Layers or Branches of your Trees.

This Bird is so bold that no Scare-crow or other thing will frighten him from the Trees he delights to feed on; but on the *Morocco* Plum or the *Damson*, he will settle and feed, notwithstanding all you can do: so that the best way to preserve these Buds, is to Birdlime the Twigs.

Goldfinches.

*Goldfinches* are very injurious to the *Gooseberry* Buds, coming in Flights, and cleansing of a whole Garden of them immediately, as the *Bullfinches* will the Bud of the *Currant-trees*: The remedies against them are the same with the other.

Chaffinches.

The *Chaffinch*, *Greenfinch*, *Titmouse*, and other small Birds are injurious to some Fruits; but not like those beforementioned, who will prey upon the Buds of all Sorts of Fruit-trees, under the very Nets that cover the Trees, and near unto the dead Bodies that hang on them.

*Sparrows*, although they are but small, yet are they a numerous Generation of Corn-eaters: It is unknown how much they devour, and what a great damage they are to the Husbandman, especially in scarce and dear Years.

Many ways are made use of to destroy them, but none more effectual than the large folding Sparrow Net, which will take many dozens at a draught: They being so easily induced to come to a thrap or place baited for them, especially in hard Weather



Weather in the Winter, and in the Summer before the Corn is ready for them: At both which times meat is scarce abroad, and then they flock to Barns. To prevent Birds eating of new sown Corn, sow Lime or Soot upon it.

Moist and warm Lands, which are usually the most fertil, are most subject to these Vermin: *Frogs* are best destroyed and prevented in *February* in the Ditches where they Spawn, by destroying of both *Frogs* and Spawn. *Toads* are easily destroyed in Summer Evenings (by a Candle) creeping up and down the Walks and Passages about your House and Gardens, &c.

*Frogs.*

To Wall-fruit and several Sorts of Garden-plants, there cannot be a worse enemy than *Snails*, which you may in a dewy Morning easily find where they most delight to breed; but the surest way is in the hard Winter to seek out their haunts, and to make a clean riddance of them: They lie much in the holes of Walls, behind old Trees, under Thornes or other old and close Hedges, &c.

*Snails.*

Ever observe not to pluck off such Fruit as the *Snails* have begun to feed on, but let it remain: for they will make an end of that, before they begin any more.

The best way to take *Snails*, is to set Tyles, Bricks, or Boards hollow against a Wall, Pails, &c. So as that the *Snails* may seek shelter under them. About *Michaelmas* the *Snails* secure themselves in such places for the whole Winter, unless you prevent them by taking of them in *December*, and destroying of them, which is an easie and sure way to rid your Garden of them.

*Worms* are very prejudicial to Land by eating the Roots both of Corn and Grass, especially when the Corn begins first to shoot.

*Worms.*

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The best thing to destroy them is any thing of Salt; and therefore I believe that Sea-water would be a very great Improvement of Lands near the Sea that are troubled with them.

I had once a piece of very rank Clay Land that was very full of Worms, upon which I sowed Soot, which killed several Bushels of them: But I have try'd Soot upon other Clay Lands, and other Sorts of Land too, without finding of the same effect, whether it was because of the difference of the Soil, or the time of the Year that I did it in, or whether it was because the other Land was footed before, I could never yet find.

Some commend Chalk and Lime as very good to destroy them. The Winter fallowing of Land in a wet time when the Worms come upon the top of the Ground, is very good also to kill them, especially if you drive some Nails with sharp heads into the bottom and sides of your Plow which will cut them to pieces.

If they are prejudicial in your Garden, water your Beds or Walks, with the Brine that you salted your Meat in, or with a strong Lixivium made of Ashes.

Or you may lay Ashes or Lime about any Plant you desire to preserve from Snails or Worms, and they will not come near it; because the hot biting nature thereof hurts their tender Bodies; only as the Rain or Moisture weakens the Ashes or Lime, you must renew it.

*Gnats and Flies.*

*Gnats and Flies* are very troublesome in Houses especially such as are situated near watery places, and do mischief in the Fields by eating the Leaves of several things, as they come up first, especially Turneps, so as sometimes to destroy whole Fields.

To keep your Houses clear of them, keep your Chamber Windows close in Summer time, especially towards Evening, and smoak your Rooms well with

with Brimstone, or burn Straw in them, which will cause them to fly into the Flame, and be consum'd, or else the Smoak will choak them.

Ashen-Leaves hanged up in the Room will attract them unto 'em that you will be less troubled with them.

Balls made of Horse-dung and laid in a Room will do the same if they are new made; by which means you may whelm some things over them and keep them there.

*Wasps* and *Hornets* usually prove very injurious to some Sorts of Fruit, to Bees, &c. and are several ways destroyed. *Wasps and Hornets.*

First, By way of prevention, that is in the Spring or Summer before they have increased, to destroy the old ones: For from a few they do increase to a Multitude.

Or you may smoke or stifle them if they are in a hollow Tree, or scald them if in the Thatch of an House or Barn, &c. or in the Ground you may either scald or burn them, or stamp in the Earth upon them, and bury them.

To destroy such as come to the Fruit, Bees, &c. set by them Cyder, Verjuice, sowre Drink, or Grounds, in a short neck'd Vial, wherewith you may catch many.

Also you may lay sweet Apples, Pears, Beast Livers, or other Flesh, or any thing that they love, in several Places; upon which you shall have sometimes as many as will cover the Bait, which you may kill at once.

*Catterpillars* destroy the Leaves of Trees in Summer, devour Cabbages and other Garden Tillage, and are generally the Effects of great Droughts. *Catterpillars.*

To prevent their numerous Increase on Trees gather them off in Winter, taking away the Prickets which cleave to the Branches, and burn them: But if they get on Colliflowers or Cabbages, take some



some Salt-water and water them with it, and it will kill them.

In the Summer while they're yet young, when either through the coldness of the Night, or some Humidity, they are assembled together on heaps, you may take them and destroy them.

*Earwigs.* *Earwigs* in some Years prove injurious to Fruits by the greatness of their Numbers, feeding on and devouring them.

They are destroyed by placing Hooks or Horns of Beasts amongst your Trees and Wall-fruit, into which they will resort. Early in the Morning you must take them gently but speedily off, and shake them into a Vessel of Water.

*Lice.* By reason of great Droughts many Sorts of Trees and Plants are subject to *Lice*; and seeing they are caused by Heat and Drought, as is evident in the Sweet-bryar and Gooseberry that are only lousie in dry Times or in very hot and dry Places; therefore frequent washing them by dashing Water on them may prove the best remedy.

*Ants.* *Ants* or *Pismires* are injurious to a Garden, and also to Pasture-Lands, as well by feeding on Fruit, as by casting up of Hills, &c.

In the hotter Regions these Creatures are reckoned amongst the Pests of the Field, as in *Italy*, *Spain*, and also in the *West-Indies*; yet are they commended as the Emblem of Knowledge and Industry, and were used by the *Egyptians* as the Hieroglyphick of Knowledge, every one of them laying up his own Store for the Winter, never robbing their Fellows, altho' they want themselves.

To keep them from Trees, incompass the Stem four Fingers breadth with a Circle or Roll of Wooll newly pluck'd from a Sheeps Belly.

To anoint the Tree with Tar will do the same; but as Tar is prejudicial to Trees, I should rather prefer

prefer Man's Ordure, which I believe will do beyond the other ; because if any of it be put into their Hills, it will kill them.

Also you may have Boxes of Cards or Past-board pierced full of holes with a Bodkin, into which Boxes put the Powder of Arsenick mingled with a little Honey : Hang these Boxes on the Trees, and they will certainly destroy them. Make not the Holes so large that a Bee may enter, lest it destroy them too.

Also you may hang a Glass-bottle in the Tree with a little Honey in it, or moisten'd with any sweet Liquor, and it will attract the Ants, which you may stop and wash out with hot Water, and prepare it again as above.

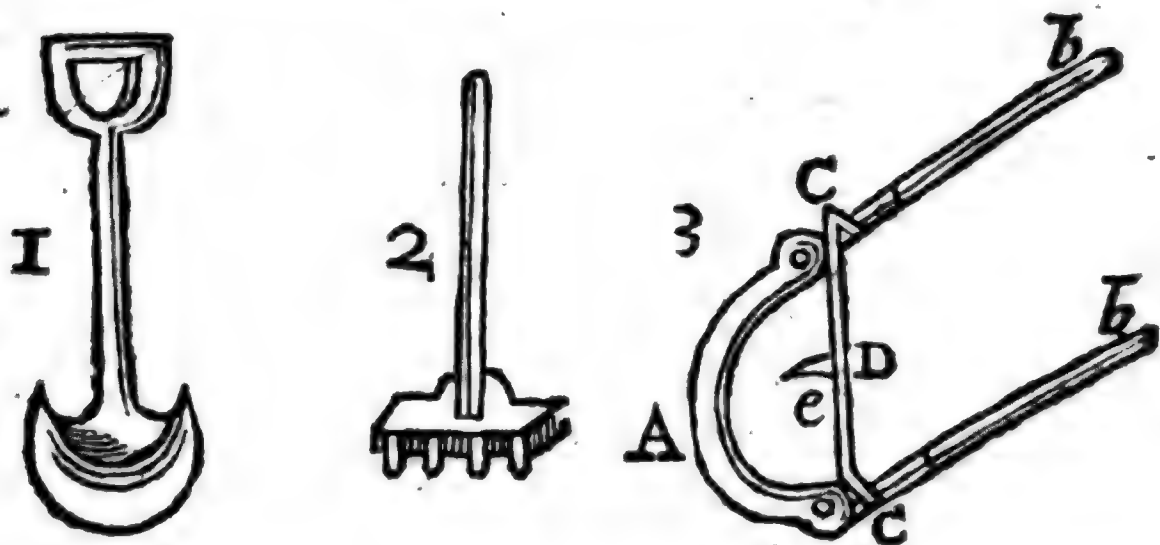
Watering often of Alleys or green Walks will drive away or destroy the Ants that annoy them.

Ant-Hills prove a very great Injury to Meadows and Pasture-Land, not only by wasting of so much Land as they cover ; but by hindering the Scythe, and yielding a poor hungry Food pernicious to Cattle.

To destroy their Hills, cut them into three or four Parts, beginning at the Top, and open the Hills so as to dig out the Cores below the Surface so deep, that when you lay down the Turf in their Places they may lie lower than the other Ground, to the End that the Water may stand in it to prevent the Ants from returning, which they will else certainly do : Then spread the Earth you take out thinly abroad. The proper Season for the doing of which is in Winter, and if the Places be left open a certain time, the Rain and Frost coming on it will help to destroy the rest of the Ants : But be sure to cover them up time enough that the Rain may settle the Turf before the Spring : The Price of doing of which, where a  
Man

Man hath Fourteen-pence a Day, is Five-pence per Hundred.

In *Hertfordshire* they have a particular Sort of Spade which by reason of the sharpness of its Edges is very convenient for this Use: Its shape you have at Figure 1. and at Figure 2. is an In-



strument much used in the West Country for the spreading of Mole-casts, the Teeth of which being Iron and broad, rakes out the Mould and spreads it; and at the other side where there is a kind of heel or knob, 'tis very convenient to break Clots with; but where there are great Quantities of Hills, and that you have a mind to make a quick Riddance of them, you may make use of the Engine at Figure 3. which at A hath a sharp Iron about three Foot over with a strong Back, 'tis about four or five Inches broad; at *b b* are two Handles to hold it by; at *C C* are two Loops or Holes to fasten the Horse Traces to that draws it; at *D* is a cross Bar of Iron to strengthen it, from which at *e* is a small Piece of Iron like a Plough-share to cut the Mole-Hill into two; or you may have two of the same Pieces of Iron which will divide the Mole-Hills into four Parts. With this Instrument, having one Horse to draw it, a Boy to drive, and a Man to hold it, you



you may cut as many Hills in a Day, as eight Men can do the common way; only as it cuts the Hills up by the Roots, so it leaves a bare Place under them which is some prejudice to the Land, but that may be sown with Hay-seed, Clover, &c. and it will quickly have Grass on it. The Conveniency of which Instrument if it would engage People to the clearing of their Land of so great a piece of ill Husbandry, as many in several Parts of *England* are guilty of, by letting of their Land be run all over by these Hills, it would I think be of very great use to the Publick: But many forbear to destroy them upon a supposition that they gain Ground by them, which is a very great Mistake: For suppose a Hill whose Basis or Diameter is twenty Foot, and that the Ascent of the said Hill is fifteen Foot, and the Descent fifteen more, which makes thirty Foot: Now every body will own that the Diameter of the Hill which is twenty Foot may be pailed in with twenty Deals of a Foot broad, and the same Number of Deals will inclose the Ascent and Descent of the Hill also, because the Boards stand perpendicular upon the sides of the Hill; and therefore Grass and Corn both growing upright, I do not think that any Land is gain'd either by Hills, or by the raising of Ridges.

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## BOOK VIII.

## Chap. I. Of the general Uses of Corn, Grain, Pulse, and other Seeds propagated by the Plough.

*Wheat.*

**W**HEAT is the most general Grain used in *England* for Bread : Altho' it's not unfit for most of the Uses the other Grains are fit for ; as for Beer, a proportion of which being added to the Malt, helps much the keeping of it : If a little Wheat-bran is boiled in our ordinary Beer, it will cause it to mantle or flower in the Cup when it is poured out ; which sheweth with what a rich Spirit Wheat is endow'd, that so much remains in the Bran. If Wheat be malted, and a small Quantity added to other Malt, it will add much to the strength of your Beer ; but it's something more fulsome, being reputed to be a principal Ingredient in the making of Mum. Starch also is made of musty, unwholsome Wheat, and of the Bran thereof, than which there are few things whiter.

*Barly.*

The principal Use of *Barly* is for the making of Beer, being the sweetest and most pleasant Grain for that purpose : It is one of the best Grains for the fattening of Swine, being either boiled 'till it be ready to burst, with no more Water than it drinks up, or ground in a Mill, and wet into Past, or made into a Mash, either way it produces excellent Bacon.

*Malt.*

*Malt* being an excellent Merchandise, and a Commodity of great Profit to the Husbandman, and the making of good Beer depending much upon it (besides the well brewing of it, which I shall

shall defer the treating of, 'till I come to give an Account of *English Liquors*;) I think it may be of use to the Farmer to know when his Malt is well made, if he doth not make it himself: And likewise for the Improvement of our *English Liquors*, to consider some of the several ways of making of Malt; in order to which I shall,

*First*, Begin with the common way of making of Malt, as describ'd by Mr. *Markham*.

*Secondly*, The way of making of Malt in *Derbyshire*, according to the Description given in Mr. *Houghton's* Papers, and likewise transcribe the Account given by Sir *Robert Murray* in the Transactions of the Royal Society, of the way of making of Malt in *Scotland*, together with some other particular Observations, that I think may be of Advantage to the Maltster and Farmer.

To begin with the Art of making (or, as some term it, melting) of Malt, according to Mr. *Markham's* way; you must first (having proportion'd the Quantity you mean to steep, which should ever be answerable to the Content of your Cistern, and your Cisterns to your Floors,) let it run down from the upper Granary into your Cistern, or otherwise be carry'd into your Cistern, as you shall please, or your occasions require. This Barly should by all means be very clean, and when your Cistern is filled, you should from your Pump or Well convey the Water into the Cistern 'till all the Corn be drenched, and that the Water float above it; if there be any Corn that will not sink, you should stir it about and wet it; and so let it rest and cover the Cistern; and thus for the space of three Nights you should let the Corn steep in the Water. After three Nights are expired, the next Morning pluck out the Bung-stick or Plug, which stoppeth the Hole in the Bottom of the Cistern, and so drain the Water clean from the Corn, and



save the Water : For much light Corn and other things will come forth with it, which is very good Swines-meat : Then having drained it, let the Cistern drop all that Day, and in the Evening with your Shovel empty the Corn from the Cistern into the Malt-floor ; and when all is out, and the Cistern cleansed, lay all the wet Corn on a great heap round, or long, and flat on the Top, and the thickness of this heap must be answerable to the season of the Year ; for if the Weather be extreme cold, then the heap shall be made very thick, as three or four Foot or more, according to the Quantity of the Grain : But if the Weather be temperate and warm, then shall the heap be made thinner, as two Foot, one Foot and an half, or one Foot ; this heap is called by Maltsters a Couch or Bed of raw Malt.

In this Couch let the Corn lie three Nights more without stirring ; and then if you find that it beginneth but to sprout ( which is called coming of Malt ) tho' it be never so little, as but the very white End of the Sprout peeping out ( so it be in the outward part of the heap or couch ) then break it open, and in the midst where the Corn lay nearest you will find the Sprout or Come of a greater largeness, then with your Shovel turn over all the outward part of the Couch inward, and the inward outward, and make it at least three or four times as big as it was at first, and so let it be all that Day and Night ; and the next Day with your Shovel turn the whole heap over again, increasing the largeness, and making it of one indifferent thickness over all the Floor, not above a handful thick, at the most, not failing after for the space of fourteen Days ( which doth make up in all full three weeks ) to turn it all over twice or thrice a Day, according to the Season of the Weather ; for if it be warm, the Malt must be turn'd oftner ; if cool,

cool, then it may lie looser, thicker, and longer together; and when the three Weeks are fully accomplished; then (having bedded your Kiln, and spread a clean Hair-cloth thereon) lay the Malt as thin as may be (as about three Fingers thickness) on the Hair-cloth, and so dry it with a gentle and soft Fire, ever and anon turning the Malt (as it drieth on the Kiln) over and over with your hand till you find it sufficiently well dried; which you may know both by the Taste when you bite it in your Mouth, and also by the falling off of the Come or Sprout, when it is thoroughly dried. Now as soon as you see the Come begin to shed, you must in the turning of the Malt rub it betwixt your hands, and scowre it to make the Come fall away; then finding it all sufficiently dried; first put out your Fire, and let your Malt cool upon the Kiln for four or five Hours, and after the raising up the four Corners of the Hair-cloth, and gathering together the Malt on a heap, empty it with the Come and all into your Garners, and there let it lie (if you have not present occasion for it) for a Month or two to ripen, but no longer. For as the Come or Dust of the Kiln for such a space melloweth and ripeneth the Malt, making it both better for Sale or Expence: So to lie too long in it doth ingender Weevles, Worms and Vermin, which destroy the Grain.

Now for the dressing and cleansing of Malt you must first winnow it with a good Wind either from the Air or Fann, and before the winnowing you must rub it well between your Hands to get the Come or Sprouting clean away: For the Beauty and Goodness of Malt is when it is most sinug, clean, bright, and likest to Barly in the View; for then there is least Waste, and greatest Profit: For Come and Dust drinketh up the Liquor, and gives an Ill-taste to the Drink. After it is well rubbed and

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winnowed, you must then Ree it over in a fine Sieve, and if any of the Malt be uncleansed, then rub it again into the Sieve 'till it be pure, and the rubbings will arise on the Top of the Sieve, which you may cast off at pleasure ; and both those rubbings, the Chaff and the Dust which come from the Winnowings, are very good Swine's-meat, mixt either with Whey or Swillings. And thus after the Malt is reed, either put it up in Sacks, or into a well cleansed Garner.

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**Chap. II. *Certain Observations of Mr. Markham's about the Making of Malt.***

**F***irst*, He says there is a difference in Men's Opinions, as touching the constant time, for the mellowing and making of the Malt, that is, from the first steeping until the time of drying; for some will allow both Fat and Floor hardly a Fortnight, some a Fortnight and two or three Days, for these reasons:

*First*, They say it makes the Corn look whiter and brighter, and gets not so much of the sullyng and foulness of the Floor, as that which lieth three Weeks, which makes it a great deal more beautiful and saleable: Next it doth not Come or Shoot out so much Sprout as that which lieth a longer time, and so preserveth more heart in the Grain, makes it bold and fuller, and so consequently more full of Substance, and able to make more of a little, than the other of much more.

Mr. *Markham* says, these reasons are good in shew, but not in substantial truth; for, altho' he confesseth that Corn which lieth least time on the Floor, must be the whitest and brightest; yet that which wanteth any of the due time, can neither ripen, mellow or come to true perfection, in less  
than



than three Weeks, cannot ripen Barly ; for what time it hath to swell and sprout, it must have full that time to flourish, and as much time to decay. Now in less than a Week it cannot do the first, and so in a Week the second, and in another Week the third ; so that in less than three Weeks a Man cannot perfect Malt. Again, he confesses that Malt which hath the least Come must have the greatest Kernel, and so be most substantial ; yet the Malt which putteth not out his full Sprout, but hath that Moisture ( with too much heart ) driven in which should be expelled, can never be Malt of any lasting, because it hath so much moist Substance, as makes it both apt to corrupt and breed Worms. It is true, that this hast-made Malt is fairest to the Eye ; and being spent as soon as bought, little or no loss is to be perceiv'd ; yet if it be kept three or four Months longer ( unless the place where it is kept be like a Hot-house ) it will so give again, that it will be little better than raw Malt, and so good for no Service without a second drying.

Besides, Malt that is not suffer'd to sprout to the full kindly, but is stopped as soon as it begins to peep, much of that Malt cannot come at all ; for the moistest Grains do sprout first, and the hardest are longer in breaking the Husk : Now if you stop the Grain on the first Sprouts, and do not give all leasure to come one after another, you will have half Malt and half Barly.

Next, there ought great Care to be taken in the well turning of Malt, or else some will come too much, and some too little : And likewise in the coming or sprouting of Malt, which as it must not come too little, so it must not come too much, and that which is called comed or sprouted too much, is when either by negligence for want of looking to the Couch, and not opening of it ; or for want of turning when the Malt is spread on the Floor,

it Comes and Sprouts at both Ends, which is called *Acrospired*, and is fit only for Swine; and therefore you must be sure to have an especial Care in ordering the Couch, to heap the hardest Grain inward and warmest to make it all come very indifferently together. And if it happens that your Barly is some old and some new Corn mixed together, you may be assured this Grain can never sprout equally together, by reason the one exceedeth the other in Moisture: Therefore in this case you must observe which comes first, which will be in the heart of the Couch, and with your hand gather it by it self into a separate place, and then heap the other together again, and so continue to do 'till all the other is sprouted. And observe that if your Malt be hard to come or sprout, and that the fault consists more in the Coldness of the Season, than any defect of the Corn, you may cover the Couch over with thick woollen Cloths, &c. the warmth whereof will make it come presently; which once perceived, forthwith uncloath it.

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Chap. III. *An Account of the Way of making of Malt at Derby, as describ'd in Mr. Houghton's Letters of Husbandry and Trade.*

THE Barley, of which they usually make Malt in *Derbyshire*, is of two Sorts, either Sprat, or Long-ear, so called from the length of it; or Battle-door Barly, from the flatness of the Ear. Each of these is a like good for making Malt. In choosing Barley for this use you must look that it be bold, dry, sweet, of a fair Colour, thin skin, clean faltered from Hains, and dressed from foulness, Seeds and Oats. Any one that is accustomed to it by barely handling the Corn in the Sack will easily perceive whether it be bold, dry and well dressed

fed or not; the colour and Fashion of it will enable you to judge whether the Husk be thick or thin; the sweetness is found by the Smell: For some will appear fair to the Eye, which by the smell we may find to have receiv'd such hurt in the Mow as renders it unfit for Malting. If the Grains be of a dark Colour, and many Corns have brown ends, we may judge them to have been heated in the Mow, and they seldom come well in the Couch.

Having put what quantity of Barly we think fit into Cisterns, we cover it with Water, esteeming that drawn from the Brook by reason of its fatness, much better than that from the Spring: In this we let it steep, till crushing the Corn, set end-ways betwixt our Fingers, the Husk will rise and shoot a little from it, then we draw off the Water and let it lie six, eight, ten or twelve hours to drain.

Now Barly bought about *Michaelmas* takes much less time in the Water, than afterwards when it has had the Sweat in the Mow. I suppose, because the Pores of its Skin or Kernel are more open, and which some wonder at after a dry Year when it hath little Rain in the Field and none in Swath, it imbibes the Water faster and is sooner steeped, than when it hath plenty of Rain in the Growth, and some after it is cut before it be inned into the Barn.

Most experienced Maltsters judge it fit to give the Barly something too little rather than too much Water, because having imbibed too much, many Corns will smilt, or have their Pulp turn'd into a substance like thick Cream, which crushes out in stirring, others will have the Spirit drowned, and most of those which come without extraordinary pains will send forth their substance in an Acrospire.

The Barly being thus steeped enough, and the Water well drain'd off, we throw it out upon the Couch-Floor; if the weather be immoderately warm



warm we immediately Couch it about a Foot thick; but if we perceive it hath taken much water, or a hotter Season require it, we spread it on the Floor much thinner; yet if the weather be moderately cold, we let it lie twelve hours on a heap, the Edges being only swept close up; after which, or a longer time in a Frost, we spread it in such a thickness as the weather and water it seems to have taken may require.

Thus laid it is stirred with the broad casting Shovel usually thrice a day in moderate weather, but in cold only twice, and in hard Frost when the outsides of the Couch are apt to freeze (for the middle will never) I have known them couch'd up a Yard thick cover'd with an Hair-cloth and stirred only once a day; the Maltster being always careful to throw the frozen outsides into the middle till the Corn begin to fork and warm in the Couch; after which time if it be not laid too thin, it will not easily freeze.

Sometimes in the hot Months of *May, June, &c.* the Maltster will stir his Barly-Couches till the Sprit begins to fork, five or six times a day or more; it being always his care to keep them from drying too much on the outsides, lest they again be parched into Barly. But all his care in Summer is sometimes too little, for the heat will so dry the Barly, that tho' it seem to come well yet wanting moisture to put an Acrospire back, Malt proves but harsh and hard.

The Barly after it has been couch'd four or five days in cold weather will sweat a little, and begin to shew the Chit or Sprit at the root end of the Corn, and in four or five days more (during which time it continues sweating, as is easily seen by stroaking of the drier top of the Couch) it will become long enough; but now except the weather grow cold, it must still be laid thinner, and stirred

red three times a day or four ; when the Come is long enough, at least in Summer, I have known it Chit in 24 hours after it had been thrown forth of the Cistern, and within three days come enough, the Maltster being forced to stir it six, seven or eight times a day, to keep it from running out, or the Sprit from coming too long : sometimes I have known the Chit to peep before the Cistern was emptied in the heat of Summer, but this was only at the top of the Cistern : and in such a case it is the chief art of the Maltster to make the Barly Come even in the Couch.

It is a laborious time to the Maltster when Barly begins to grow in the Fields in the Spring, for that in the Couch by some kind of Sympathy will be so active, that it will require extraordinary much stirring to keep it from coming too long, or emptying the Pulp of the Corn in Sprits, which it is his care to prevent, not only lest it shrink the Corn in measure, which it will do something ; but also lest it leave him only the Husk of the Corn instead of Malt.

When the Malt is come enough, we throw it thinner on the Floor, to wither it, and stir it once or twice that day extraordinary. When it is once stopt with ordinary care and stirring, it will be kept from coming. The Corn is usually come enough, when the Sprits are about half an Inch long, but in Summer let it come a little longer than in Winter, to make the Malt rash. If it be come too much it will look rugged, and be apt to stick together, and when stirr'd it will fall uneven, or on heaps : then being stay'd from coming, we remove it into our upper Floors, where we keep it with stirring in hot weather three, four or five times a day, to wither it as necessity requires.

One thing I must not omit, since many Maltsters are ignorant of it ; when the Sprits come forth at  
the

the root end of the Corn, another Sprit which we call the Acrospire begins to stir at the same end, and as the exterior Sprits run fast out, it moves slowly backward under the Skin unseen, and when they are come long enough, it is seldom gone further back than the middle of the Corn; but if the Malt afterwards be not cooled too hastily, or cast over thin on the withering Floor, this will run back to the end of the Corn, to which if it reach not, the part of the Corn which it passeth not, will remain unmalted, the rest will be perfect Malt. But if for want of stirring the Malt, or giving the Barly too much water in the Cistern, both which cause it, the Acrospire come out, it carries forth with it the heart of the Corn, and leaves little but Husk, especially if it get length, as before intimated.

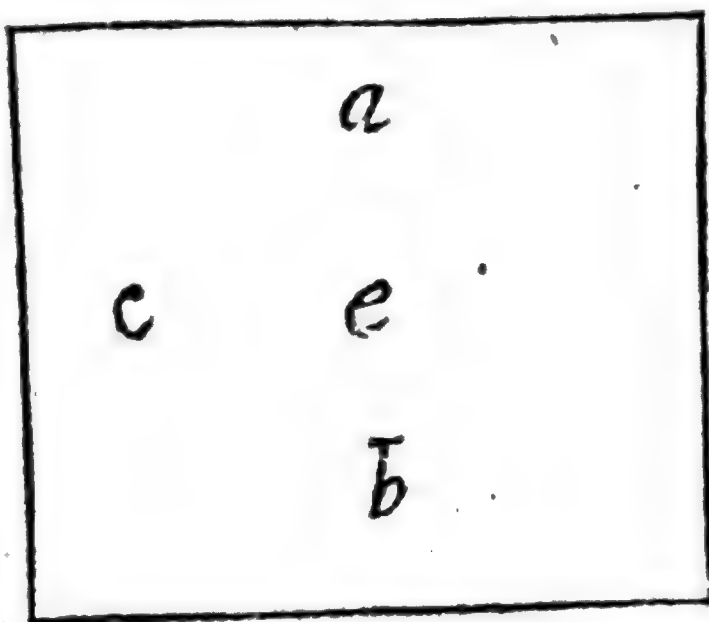
After the Malt has lain on the withering Floors about twelve or fourteen days, it will be fit for the Kiln, or sooner, if it begin to Acrospire; yet in sharp frosts it will scarce be ready in three weeks.

In Summer time and hot weather the Corns that are bruised by the Maltsters Feet or Shovel in stirring, will be apt to mould, and the Malt if kept but a little too thick, or omitted when it ought to be stirred, will Acrospire; and if to prevent the acrospiring it be thrown thin, many Corns will dry and parch into Barly again. Moreover in those that Come, the Acrospire will scarce run back to the middle of the Corn, so that one half of it will be left Barly, which is the cause why the Summer made Malt brews ill, and is disliked by most of our Ale-brewers. The Malt made in the hot weather of the Summer will not abide to lie above seven days on the Floor after it is come enough, before it be convey'd to the Kiln, by reason it is apt to contract mould, which has a bitter taste, and gives Drink an ill Relish; but when the weather is cool in Summer, as good Malt may be made as after *Michaelmas*. The



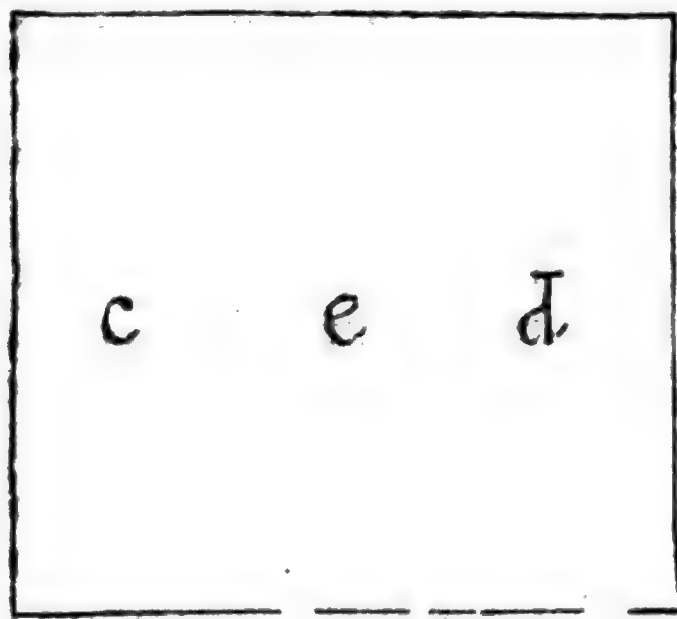
The Malt is laid on the Kiln to dry something thicker than it lay on the withering Floor, where when it has lain five hours, with constant fire under it, the Maltster gives it the first turn; about four hours after, the second, and some three hours after that, the third. And if the Kiln dry well in three hours more with a moderate fire (for fear of fire-fanging) it will be dry'd enough: Thus it lies about fifteen hours on the Kiln, sometimes more, and sometimes less, according to the goodness of the Kiln and greenness of the Malt, which if it be not well withered before it be laid on the Kiln will require a longer time to dry and one turn on the Kiln extraordinary. But the Brick-kiln will dry a greater Quantity in four, than we usually lay on one of the same Capacity of the common make in twelve hours. The ways of turning the Malt on the Kiln are various, the best esteemed, but troublesome, is thus.

Our Kilns being all of them four-square, we begin at any side, and with the broad Shovel cast up all the green Malt on it into two heaps in the opposite corners, the driest next the Hair-cloth into the middle space betwixt them: As if we began at the middle *e*, we throw all the green Malt into two heaps in the opposite sides *a* and *b*, but the little dry next the Hair - cloth betwixt them to *c*; then having shaken up the



Hair-

Hair-cloth so that no loose Corns may stick to it, and again laid it down very streight, we re-



move the green heaps to the opposite sides *d c*, as in this Figure, but the little middle heap, with the dry under the other two, the shakings of the Cloth, af-

ter they are removed to the space betwixt them *e*; then again composing the Hair-cloth, we first cast down the two green heaps all over it of an uneven thickness, and the dry heap all over them, thus the greenest is turned to the bottom, and the dry lies on the Top. Afterwards the Maltster rakes it all over with a wooden Rake, to leave it every where of as even a thickness as possibly he can.

But the most usual, though not so much approved way is this; the Maltster throws all the Malt on the Kiln on one close heap, in the middle of it, then shakes up his Hair-cloth, which being laid down again very even, he casts the said heap abroad again round the Kiln, clearing the Hair-cloth all that breadth where it lay, or something wider, which place he sweeps clean with a Broom, lest any Corns sticking to it, should be fire-fanged, then he fills up the said swept place with Malt cast into a round from the sides, and raking it very even, leaves it.

His Malt being dry'd enough he removes from the Kiln, and laying it above a Foot thick, treads it round three or four times, beginning at the out-sides,

sides, and winding himself round, till he hath trod up to the middle of the heap, and so back to the outsides again; this he calls a course, and in going two or three such courses his Malt, if well dried, will be trodden enough, that is all the Come will be rubbed off; then if the Malt be to be kept long he throws it upon a heap in the Dust; but if it be to be sold within two or three Months after, he dresseth the Dust from it by running it through a Fan or Frie, that so it may take the Air better in the heap and become more mellow. When Malt is to be used, it is best to have it ground ten or twelve days before it be brewed.

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Chap. IV. *An Account of the manner of making Malt in Scotland, by Sir Robert Murray, according to the method given by him in the Transactions of the Royal Society.*

**M**ALT is there made of no other Grain but Barly, whereof there are two kinds; one which hath four rows of Grain on the Earth, commonly called Big, and the other two rows. The first is the more commonly used; but the other makes the best Malt.

The more recently or sooner Barly hath been thrashed it makes the better Malt. But if it hath been thrashed six weeks or upward, it proves not good Malt, unless it be kept in one equal temper; whereof it easily fails, especially if it be kept against a Wall: for that which lies in the middle of the heap is freshest, that which lies at the outsides and at top is over dried, that which is next the Wall shoots forth, and that which is at the bottom rots. So that when it comes to be made into Malt, that which is spoiled does not come well (as they call it) that is, never gets that right mel-



mellow temper Malt ought to have, and so spoils all the rest. For thus some Grains come well, some not at all, some half, and some too much.

The best way to preserve thrashed Barly long in good temper, is not to separate the Chaff from it: but as long as it is unthrashed it is always good. Brewers use to keep their Barly in large Rooms on boarded Floors laid about one Foot in depth, and so turned over now and then with Scoops.

Barly that hath been over-heated in the Stack or Barns before it be separated from the Straw, will never prove good for Malt nor any other use. But though it heat a little after it is thrashed and kept in the Chaff, it will not be the worse, but rather the better for it; for then it will come the sooner and more equally.

A mixture of Barly that grew on several Grounds, never proves good Malt, because it comes not equally. So that the best Barly to make Malt of, is that which grows in one Field, and is kept and thrashed together.

Take then good Barly, newly thrashed and well purged from the Chaff, and put thereof eight Boles, that is about six *English* Quarters, in a Stone-trough, where let it infuse, till the water be of a bright reddish Colour; which will be about three days more or less according to the moistness and driness, smallness or bigness of the Grain, season of the Year, or temper of the Weather. In Summer Malt never makes well; in Winter it will need longer infusion than in the Spring or Autumn.

It may be known when steeped enough, by other marks besides the Colour of the Water, as the excessive swelling of the Grain; or if over steeped, by too much softness, being, when in the right temper, like that Barly which is prepared to make Broth of, or the Barly called by some *Urgewonder*. When

When the Barley is sufficiently steeped, take it out of the Trough, and lay it in heaps, so let the Water drain from it; then after two or three Hours turn it over with a Scoop, and lay it in a new heap about twenty four Inches deep. This heap they call the Coming heap, and in the managing of this heap aright lies the greatest skill. In this heap it will lie forty Hours more or less, according to the fore-mentioned qualities of the Grain, &c. before it come to the right temper of Malt, which that it may do equally is most to be desired.

Whilst it lies in this heap, it is carefully to be looked unto, after the first fifteen or sixteen Hours. For about that time, the Grains will begin to put forth the Root, which when they have equally and fully done, the Malt must within an Hour after be turned over with a Scoop; otherwise the Grains will begin to put forth the Blade or Spire also; which by all means must be prevented: For hereby the Malt will be utterly spoiled, both as to pleasantness of taste and strength.

If all the Malt come not equally, because that which lies in the Middle being warmest, will usually come first, turn it over, so as the outmost may lie inmost, and so leave it 'till all be come alike.

So soon as the Malt is sufficiently come, turn it over to a depth not exceeding five or six Inches, and by that time it is all spread out, begin and turn it over and over again three or four times. Afterwards turn it over in like manner once in four or five Hours, making the heap thicker by degrees, and continuing so to do constantly for the space of forty eight Hours at least.

This frequent turning of it over cools, dries and deads the Grain: Whereby it becomes mellow, melts easily in brewing, and separates entirely from the Husk.

T

Then

Then throw up the Malt into a heap, as high as you can, where let it lie 'till it grows all as hot as your hand can endure it; which usually comes to pass in some thirty Hours space; this perfects the Sweetness and Mellowness of the Malt.

After the Malt is sufficiently heated, throw it abroad to cool, and turn it over again about six or eight Hours after, and then dry it upon the Kiln; where after one Fire, which must serve for twenty four Hours, give it another more slow Fire; if need be, a third. For if the Malt be not thoroughly dried, it cannot be well ground, neither will it dissolve well in brewing, and the Ale it makes will be red, bitter, and will not keep.

The best Fuel is Peat, the next Charcoal made of Pit-coal or Cinders; Heath, Broom and Furzes are naught. If there be not enough of one kind, burn the best first, for that gives the strongest Impression as to the Taste.

#### Chap. V. *Some farther Observations relating to Malt.*

SOME are of Opinion that the best and most natural way of drying Malt is in the Sun in the Months of *April* and *May*, especially for those that make but small Quantities for their own use, this making not only the palest but the most kindly, and wholesome of all others. The Drink made thereof hath a delicate Mildness, being of a warming exhilarating Quality, not so apt to heat the Body, nor send fumes into the Head. In all hot Seasons it may be done, every Man drying enough for his own Use; also it may be done to great Advantage in hot Countries.

Some of late have cover'd their Kilns over with Wyer instead of Hair-cloth, which is much the better



better way; for this doth not only dry it sooner, but cleaner and much sweeter; for by the means of this Grate, as it may be called, the properties of the Fire pass away more freely, and sweetning Vapours of the Air are not so much hindered from circulating, and therefore not so much Humidity contracted; but their Cloths are thick, which prevents the fiery sulphurous Vapours from passing away, but are as it were beat back, and so do with great Violence seek their Centre whence they proceed; that is re-enter the Fire; but finding no agreeable matter to incorporate with, they become more intense and raging, and so with a rapid Motion ascend, whereby the Heat that comes thro' the Cloth is still more stupefying, gross, sulphurous and hurtful to the Malt, as is most manifest by the Airs in all close places, as where Stoves are, the Air having no free Circulation; besides they are more cleanly and apt for the purposes, and the Malt will be whiter and afford more lively and brisk Spirits.

In *Hertfordshire* they dry their Malt both with Wood and Straw so fine, that it shows finer than the Barley it was made of, giving both the same Colour and Taste to the Drink as the *Derbyshire* Malt: I having near *Royston* drank as good Ale brewed with it, as any that either *Derby* or *Nottingham* affords, and of the same Flavour and Taste; which they make so fine, as they tell me, by conveying of the Smoak from it, and by giving fifteen or sixteen Hours time to the Malt to dry on the Kiln; whereas according to the common way, they do not use to allow above four or five Hours, making good that old saying, *That soft Fire makes sweet Malt*: But this Sort of Malt is not so profitable as the other, being three or four Shillings in a Quarter dearer. And whereas the common Malt increaseth a Bushel in a Quarter; it's rare

if forty Bushels of Barley at *Derby*, produce forty Bushels of Malt. But I hope it will prove of advantage to improve our *English Liquors*, especially in our Southern Parts, where they have generally very bad Malt-drink.

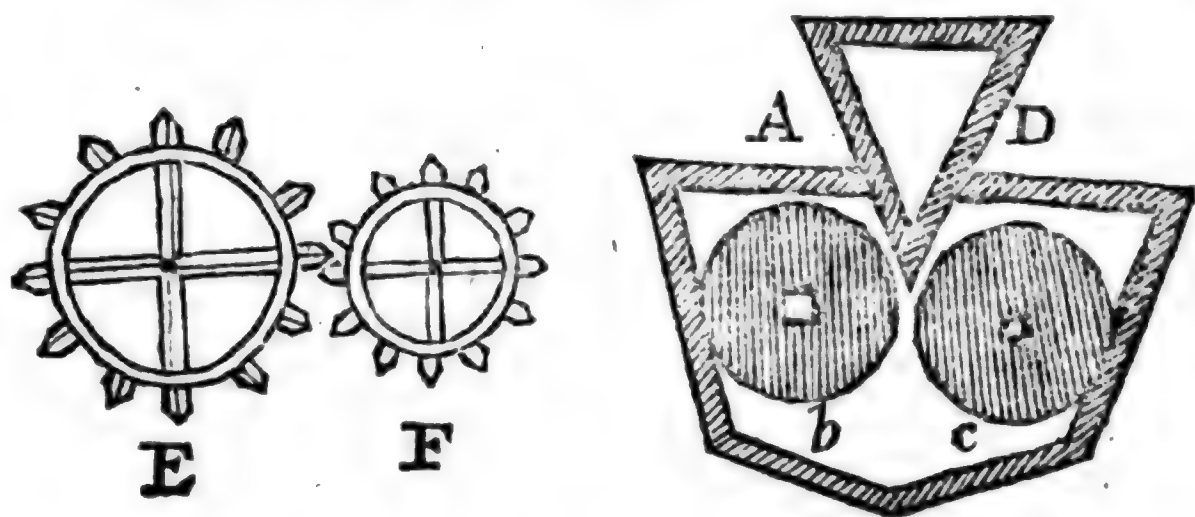
And tho' I have been very curious in getting some of the best Sorts of both *Nottingham* and *Derby* Ales. I must say the best Ale that ever I drank was at *London*, the which was brewed with half *Nottingham*, and half *Hertfordshire* Malt, made the common way. And is the best sort of Liquor if well brewed, and the Malt good: To try the Goodness of which, put a small Quantity into a Glas of Water, and what sinks is good, but what swims is naught.

Note also, that Wood cut five or six Years, and laid up dry, is one of the best Fuels to dry Malt with.

I shall farther, for the Conveniency of the Malt-Trade, add a particular sort of Mill that I think will be of good use for the grinding of it, and much more substantial and lasting than the common Mills, without being so often out of order, and which I believe will grind a much greater Quantity than the common Sorts of Hand-mills do. I must confess, that all the Trial I had of it was with one that I made with Wood, not being able to procure a Workman in the Country who could make one of Iron; however that did so well that I can no way doubt the Performance of it in Iron.

It has this particular Advantage, that it will not grind any of the Malt to Powder, but will squeeze or flat it only according to the distance you set your Rollers, which is a great Advantage in brewing.

It



It is made after this manner, *A* is the Case of the Mill, *b c* is the End of two Iron Rollers that are about four Inches Diameter, and which may be a Foot and a half, or two Foot and half long, according as you will have it to be turned by one or two Men : These Rollers must be set at such a distance from each other, as to break a single Grain of Malt, so much as you desire to have it broke. At *D* is a Hopper, the breadth of the bottom of which must be just half the length of a Barley-Corn, and near as long as the Rollers, that it may not feed them too fast. At one End of the Roller *b*, must be put a Winch with the Wheel at *E*, and another smaller Wheel at *F* to be put on the Roller *c*, if you turn it but with one Man ; but if you turn it with two Men, you may have only two Winches one to each Roller, for one Man to turn against the other ; only you must observe that one of the Men must not turn quite so fast as the other, because 'tis apt to make the Mill feed too fast.

Oats are the best Grain for Horses, tho' in hot Countries where Oats do not thrive well, Barley is used for that purpose : But there is no Grain so wholesome for them as Oats are, and being malted like Barley, they make a pretty Sort of Drink, especially if mixed with other Malt, as they do



in many places in *Kent*, where they commonly brew with one half Oat-malt, and the other half Barley-malt. Besides, the usefulness of it for Bread-cakes and Oat-meal. 'Tis a Grain that Poultry love to feed on, and they are reckon'd to make them lay more Eggs than any other Sort of Grain.

*Pease.*

The common Use of Pulse is generally known as well for Man as Beast, but there are several that pretend to extract from them excellent Liquors, and to distil very good Spirits, or *Aqua Vita*, without malting, as one (in a certain Tract publish'd by Mr. *Hartlib*) pretends that Rye, Oats, Pease, and the like inferiour Sort of Grain, handled as Barley until it sprout, it needing not for this Work to be dry'd, but beaten and moisten'd with its own Liquor, and soundly fermented will yield a mighty Increase. He also affirms, that out of one Bushel of good Pease will come of Spirit at least two Gallons or more, which will be as strong as the strongest Anniseed-water usually sold in *London*. He afterwards in the same Tract gives the particular Process which is thus :

Let Pease be taken and steeped in as much Water as will cover them, 'till they come and swell, and be order'd as Barley is for malting, only with this difference, that for this Work if they sprout twice as much as Barley doth for malting 'tis the better. The Pease thus sprouted, if beaten small, which is easily done, they being so tender, and put into a Vessel stop't with a Bung and Rag as usual, they will ferment, and after three or four Months, if distilled, will really perform what is promised.

Thus, he also adds, may be made a Spirit or *Aqua Vita* out of any green growing thing, as Roots, Berries, Seeds, &c. which are not oily.

Also

Also that the Spirit which is made out of Grain not dried into Malt, is more pleasant than the other.

'Tis not unlikely that Grain may afford its Tincture, and that excellent Beer and Ale may be made thereof without malting, but I shall leave these things to experience.

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## BOOK IX.

### Chap. I. *Of several Sorts of Instruments, Tools and Engines necessary for the Husbandman's Use.*

**T**Here being several Sorts and Kinds of Instruments that are for the Husbandman's Use, without the Knowledge of which, it will be impossible to go through the Difficulties of this Art ; as *Virgil* observes,

*The hardy Plow-man's Tools, we next must know,  
Which wanting, we can neither Plow nor Sow.*

● Amongst the Number of which are his Ploughs, Carts, Waggon, &c. and it being difficult and unprofitable to make use of such as are heavy, cumbersome and chargeable, when the same Work may as well be perform'd, if not better, with such as are easie, light, and not so costly, and with less labour ; I shall endeavour to describe to you such as are the best and most proper for each particular Sort of Work, according to such Method and Ways as have of late been discover'd to facilitate Work.

*Ploughs.*

For the *Plough* I have already given an Account of that useful Instrument, and therefore shall now proceed to consider such other Instruments as are useful for the Farmer's business, amongst which his Carts and Waggon may be esteemed some of the chief, most necessary and costly, of which there are several Sorts, and for several Uses, as for carriage of Timber, Corn, Dung, and such like; all differing the one from the other according to the several Places where they use them, and that the Countries are Hilly, Level, Stony or Clayie. In some Places they are much more curious in the forming of them than in others, making them neater, lighter and slenderer, as well in the Wheels as in other Parts. And so for the form of the Wheels, some make them more Dishing, as they call it, than others, that is, more Concave, by setting of the Spoaks and Felloes more outwards, which they reckon the stronger, because the great stress of a Wheel is when a Cart or Waggon falls on one side into a hole, which occasions the Spoaks that are underneath by the declining of the Waggon to come to a Perpendicular. And the larger a Wheel is, the easier is the Draught, because the ring or round of the Wheel is more flat, and doth more easily pass over Stones, or other Obstructions in the way, and sinks not so easily into the Cavities or defective Places of the Earth; its motion is also slower at the Center, for a Wheel of eighteen Foot circumference goes but once round, where one of nine Foot must go twice, and so proportionably; the Advantage of which is confirmed by the Opinion of several.

Chap. II.



**Chap. II.** *An Account of some Experiments, which you have in the Transactions of the Royal Society, which, as they may be of use to the curious, so may also serve for the improvement of our Carriages, and consequently both of Husbandry and Trade, which I shall give as inserted in the Transactions in the fifteenth Volume, p. 856.*

**H**AVING read in the *Mechanicks* of *Mersenus*, *Herigon* and *Dr. Wallis*, that the larger the Wheels of a Coach, &c. are, the more easily they may be drawn over a Stone or such like Obstacle that lies in their way, I was willing to try some Experiments which I thought might convince some Men better of the Truth of it, than by a Mathematical Demonstration.

I therefore ordered a Model of a part of a Waggon to be made, consisting of four Wheels, two Axes, and a Board nailed upon the Axis. The lesser Wheels were four Inches and three quarters of an Inch, and the bigger Wheels five Inches and two thirds of an Inch high, *viz.* One twelfth part of the ordinary height of the Wheels of a Waggon, the weight of the Model was almost a pound and a half; I had also two other Wheels made that were five Inches and two thirds of an Inch high, to put on instead of the lesser Wheels. The middle of the two Axes were six Inches and a quarter asunder, all the Wheels turned very easily upon the Axes.

A piece of Lead of fifty Pound and three fourths *Averdupois*, was laid upon the Model so forward, that the lesser Wheels seemed to bear above two third parts of the Weight. Then the Model was drawn with a string laid over a Pully, the top  
whereof

whereof was one quarter of an Inch higher than the top of the hinder Axis, and the middle of this Pully seven Inches and a half from the middle of the fore Axis.

The lesser Wheels being put on, and the string being tied to the top of their Axis.

1. Three Pounds drew the Model on the smooth level Table.

2. Twenty Pounds drew the lesser Wheels over a square Rod one quarter of an Inch thick.

3. Thirty Pounds drew them over a round Rod a little more than half an Inch thick.

4. Thirty one Pounds drew them over a square Rod half an Inch thick.

5. Twelve Pounds drew the hinder Wheels over the bigger square Rod.

The String being laid under the Axis, *viz.* Fifth-eight parts of an Inch lower than before.

6. Twenty nine Pounds drew the lesser Wheels over the bigger square Rod.

Then the two bigger Wheels being put on instead of the lesser, and the String lying over the Axis.

7. Three Pounds drew the Model on the Table.

8. Twenty five Pounds drew the fore Wheels over the round Rod.

9. Twenty five Pounds drew them over the bigger square Rod.

10. The String lying under the Axis, sixteen Pounds drew them over the least Rod.

11. Twenty three Pounds drew them over the round Rod.

12. Twenty three Pounds drew them over the bigger square Rod.

13. Thirteen Pounds drew the hinder Wheels over the bigger square Rod.

All these Experiments were tried twice at least, and most of them three or four times over.

In

In all of them the Lead was laid exactly upon the same part of the Board, but yet when the lesser Wheels were taken off, the Lead did not lean so much forward, so that the hinder Wheels were somewhat more pressed than they were before.

Now by comparing the second, third and fourth Experiments, with the tenth, eleventh, and twelfth, it appears how much more easily a Waggon, &c. might be drawn in rough Ways, if the fore Wheels were as high as the hinder Wheels, and if the Thills were fixed under the Axis, such a Waggon as this would likewise be drawn more easily where the Wheels cut into Clay, or Sand, or any soft Ground. And moreover, high Wheels would not cut so deep as low Wheels, as Dr. *Wallis* doth plainly demonstrate, besides some other advantages which he mentions.

Indeed low Wheels are better for turning in a narrow compass than high ones: But it seems probable that Waggon with four high Wheels might be so contriv'd, that there should be no great inconvenience in that respect, at least for such Waggon as seldom have occasion to turn short, as Carriers Waggon and such like.

The difference which you may observe in the eighth and eleventh Experiments, which is agreeable to what is said by *S. Stevinus* and Dr. *Wallis*, viz. That if a Coach, &c. must be drawn over rough uneven places, 'tis best to fix the Traces of the Coach lower than the height of the Horses Shoulders. And therefore that is not the best way which some Waggoners use, who sometimes putting their Horses in pairs, hook the Chain of some of the Horses to the Chest of the Waggon higher than they need to do.

14. A Table two Foot and half long, was set with one end, eight Inches and a half higher than the other, and the Model being loaded as before,  
less

less weight by six Ounces, drew it up the Table when the four bigger Wheels were on, than when the two bigger and the two lesser were on.

The reason of this is given by Dr. *Wallis*, and other Writers of Mechanicks, viz. Because in the first Case, there was almost the same direction of the motion of the Model, and of the String that drew it, but not in the second Case, when the fore Axis was so much lower than the top of the Pully.

For the same reasons 'tis that Carts having larger Wheels are much easier drawn than Waggon, but they have likewise another advantage, in having but one Axle-tree, for any thing drawn upon two Wheels is much easier than four, because of the double rubbing of the two Axle-trees, the rubbing of which is the main thing that occasions the Draught, else any thing drawn on Wheels would go as easie as on Ice, and because a small Axle-tree rubs less than a large, is the reason that Iron Axle-trees, though much heavier, are better than those of Wood. In *Oxfordshire* they make their Carts with Iron Axle-trees, that are fixed in one Wheel and turn in the other, which they say much eases the Draught. 'Tis certain, it eases the rubbing of one Wheel, but whether that may ease the whole Draught, I cannot positively determine, though I am apt to think it may. But though Carts are of much easier Draught in plain Countries, they are not convenient for travelling, because when loaded, in uneven Ways, they bruise the Fill-horses Sides, and often indanger the breaking of their Backs.

Likewise the higher a Cart or Waggon is set, the more apt 'tis to over-turn, and because the setting of it low, and the height of the Wheels after the usual manner of placing of them cannot consist together, therefore it may prove very commodious to place the Bed of the Cart under the Axle-tree  
at



at such a distance as the depth or shallowness of the Ways or Waters you are to go through requires; for by this means, part of the weight will be under the Axle-tree, which will so far counterpoise what is above it, that it will very much prevent the over-setting of both Carts and Waggon.

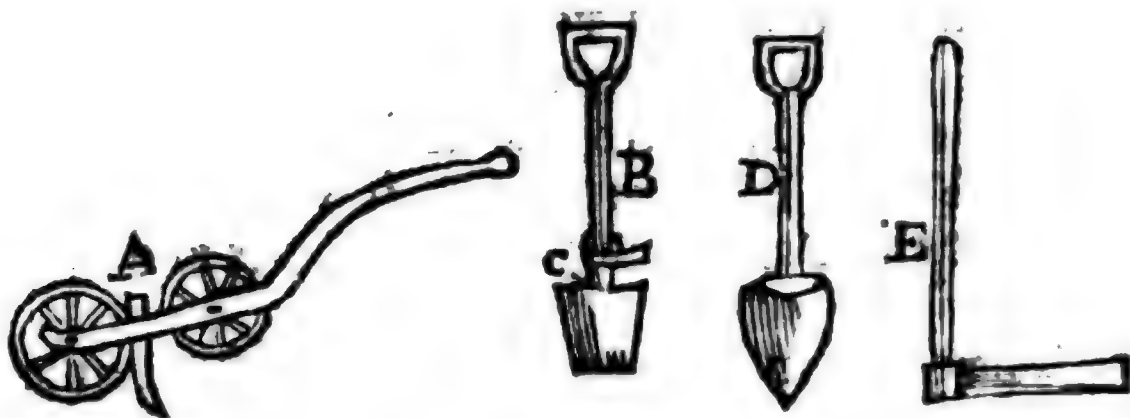
They are much more curious in making of their Carts and Waggon in *Holland* than we are, in that they make them very neat and high, so that one Horse will draw as much as two with our cumbersome heavy ones, but their Roads are good and even, which gives them a great advantage.

I shall not here mention any thing of the Sailing Waggon, and several other contrivances of that kind, till I find them brought to greater Perfection, only one ingenious Contrivance I have heard of, of a Gentleman in *Wales*, who having a Coal-pit near the Sea, from which to the Water-side is a plain descent all the way, he loads his Coals in Waggon, for the Wheels of which he hath made Grooves or Channells to run in, by which means, and the having of Sails for them, they tell me, that the Wind carries them loaded to his Wharf, and that being unloaded one Horse draws them up the Hill again.

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### Chap. III. *Of several Instruments used for Digging of Ground, &c.*

**T**Here are several Instruments I need not describe, because the very naming of them will be sufficient; and therefore those that I shall describe, shall be only some of the most uncommon and most useful, or that have something peculiar from the common Sort, and that are only used in some particular Parts.



I shall begin first with the *Trenching-Plough* or *Coulter*, which is a certain Instrument useful in Meadows or Pasture Ground, to cut out the sides of Trenches, Carriages or Drains, it is also useful to cut out the sides of Turf, for the taking of it up whole, to the intent to lay it down again in the same place or some other. It hath only a long Stale or Handle with a Button at the end for ones Hand, and at the other end it turns upward like the Foot of a Plough, to slide in the Ground, in which bend is placed a Coulter or Knife of the length you intend the depth of the Turf to be, the fashion of which you may see at A.

Several fashions there are of them, some with one Wheel, some with two, and some with none, you may make them as you please.

There are also many Sorts of *Spades* according to the diversity of places, and the several occasions and humours of Men.

At B is the shape of a Spade much used in *Essex*, the broad part of which is all Iron, the Handle going into a Socket at c, where is a piece of Iron to set the Foot on to dig with, which may be set on either side, according to the Foot the Occupier uses. This is one of the best Spades I have met with to dig hard lumpy Clays, but 'tis too small for light Garden Mould.

At

At D is a Spade made use of in the Fenns in *Lincolnshire*, the Edges of which are as sharp as a Knife, which makes it easie to cut Flag-roots, and the Roots of other Weeds, and indeed is very useful in any Lands that have not Stones in them; some of these Spades are made with one side turned up like the Breast-plough, by which means they with once jobbing of it into the Ground, can cut an exact Turf, so that one Man with one of these Spades in fenny soft Ground, will do as much in a day as two Men with a common Spade.

At E is a very convenient Instrument to dig hard Gravels, or stiff Clays, or chalky Lands with when hard. But if you make one of these Instruments about sixteen Inches long, and four or five broad, making it every way strong in Proportion, into which put a long strong Handle, this Instrument is very useful to dig strong Clays with, especially in Summer, when it will rise in large hard lumps, the way of using of which is after this manner, first dig a small Trench ten or twelve Inches deep, and about three Foot from this Trench let a Man drive down the Instrument into the Ground with a Beetle, and let two Men, having hold of the Handle when the Iron part is drove into the Ground, raise up the end of the Handie, and it will raise the Earth up with it in lumps as far as the Trench that was first cut; sometimes in hard Grounds I have known as much raised at once as would near fill a Cart, when you have broke this part out you must remove it two or three Foot farther, and so on till you begin again, which lumps they fling into the Cart at once; this is a good way for the levelling of Land, one Man this way being able to do as much as two can with the Spades or Mattocks, but if you have room and are not hindred by Roots or Stones, &c. and have a mind to level a piece of Ground, break up your Land with the  
Plough

Plough first, and by that means you will save the labour both of the Spade and Pick-ax, and be obliged only to the use of the Shovel.

Besides the forementioned, there are several other Instruments, as several kind of Hoes, Mattocks, Pick-axes, Grubbing-axes, Iron-crows, Shovels, Dung-forks, Paddles, &c. which are common every where: but if there are any other sorts of Instruments any where that are not common, and that are not mentioned, I would desire them that are willing to promote this Work, to send an account of them to the Publisher.

#### Chap. IV. *Of several other Instruments necessary for the Farmer to have.*

**I**T behoves the Husbandman that intends to thrive, to furnish himself with all things necessary for his Business, that he may not put himself to the trouble of borrowing, nor the damage he may be likely to sustain for want of them, nor the scorn or disgrace of being deny'd any thing he wants, lest according to the old Saying it proves, That he that goes a borrowing goes a Sorrowing.

And that you may not be forgetful of any, or at least of the most useful and necessary Instruments, besides the forementioned, I will give you a List of Mr. *Worlidge's*, of such as are of common Use, and advise you to add such as you find deficient, and likewise to keep them in their proper places, which many times saves a great deal of trouble.

*Things*



*Things belonging to the Arable and Field Lands are,*

Harrows,  
Drags,  
Sickles,  
Reaping-hooks,  
Weeding-hooks,  
Pitch-forks,  
Rakes,  
Plough Staff and Beetle,  
Sledges,  
Roller,  
Mole Spears and Traps,  
Cradle Scythes,  
Seed-Lip.

Brooms,  
Sacks,  
Skeps or Scuttles,  
Bins,  
Skrein for Corn,  
Pails,  
Curry-combs,  
Mane-combs,  
Whips,  
Goads,  
Harness for Horses and  
Yokes for Oxen.  
Pannels,  
Wanteyes,  
Pack-saddles,  
Surcingles,  
Cart-lines.

*To the Meadows and Pastures.*

Scythes,  
Rakes,  
Pitch-forks and Prongs,  
Fetters, and Clogs, and  
Shackles.  
Cutting Spade for Hay-Ricks.  
Horse-locks.

*To the Barn and Stable.*

Flails,  
Ladders,  
Winnowing-fan,  
Measures for Corn,  
Sieves and Rudders,

*Other necessary Instruments.*

Hand-barrows,  
Wheel-barrows,  
Dibbles,  
Hammer and Nails,  
Pincers,  
Scissors,  
Bridles and Saddles,  
Nail-piercers or Gimlets,  
Hedging-hooks and Bills,  
Garden-shears,  
A Grind-stone,  
Whet-stones,  
Hatchets and Axes,  
Saws,  
Beetle and Wedges,  
Leavers,  
Sheep-shears,  
Trowels for House and  
U Garden, Hod

Hod and Tray,	Scales and VVeights,
Hog-yokes and Rings,	An Awl, and every o-
Marks for Beasts and	ther thing necessary.
Utenfils,	

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## B O O K X.

Chap. I. *Of Buildings, Repairs, &c.*

**T**HE Farmer being often necessitated to build as well as to repair his Houses, Barns, Stables, &c. and that not only upon the Account of Decays, but of damages done by Storms and other accidents; I thought it might be of use to give him some short general Rules about Building and Repairs, and likewise of the Cost and Charges of Buildings, and of such Materials as are useful upon such Occasions, that he may the better compute his Cost and Charges himself, and not wholly trust to workmen to do it, (who often are very deceitful in such Calculations,) and know how to Let his Work to them, which is much the best way, where the Owner understands it; provided he minds one Caution, which is not to change or vary from his first Contract, which VVorkmen are very apt to perswade Men to do, if they have undertaken the Work at a low rate, or with design to ingage them in Building.

Not that I shall here pretend to give a full account of all the particulars relating to Building, and the several prices thereof, which would require a Volume of it self; but what I propose, is only so much as may give an insight unto those that understand any thing of common Arithmetick, to compute the ordinary prices of Buildings and Repairs by, and to instruct them in the most ma-

material Rules of Architecture, so far as it may fit them for their common Occasions, without committing those very gross Faults that many Builders run into.

I shall advise those that are desirous to build either out of necessity or choice, first to sit down and consider of the whole Design they intend to undertake, both as to the manner and method of it, as well as the Charge and Expence; Premeditation being a very necessary Preliminary to Building.

In order to which, I would perswade all Builders to take the Advice of such Surveyors or Workmen, as understand what they go about before they begin their Work, and that can make a good Draught and lay the Design well out, that they advise to; that so when 'tis erected, it may in all things answer the End proposed, according to such Qualifications as may make it a compleat Structure, in order to which, it ought to be contriv'd so as to have Accommodation, Proportion, Uniformity and Strength, and to be durable and lasting, all which particulars, they that raise a new House are very much to blame in, if they do not take care of; for Method and Confusion are both of a price in this Case, except only in that the latter may be dearest.

Now in Building, we ought to consider five Particulars, its Situation, Contrivance, Gracefulness, Usefulness and Beauty.

The Rules for Situation are, that it stand in a *Situation*. healthy Air, and not near Marshes, Fens or boggy Grounds, nor Rivers, except it stand on rising Ground on the North or West side of them; neither let it be destitute of Breezes to fan and purge the Air, nor want the influence of the Sun-beams, according to *Rapin's* advice;

*If on thy native Soil thou dost prepare  
 T' erect a Villa, thou must place it there  
 Where a free Prospect does it self extend  
 Into a Garden, where the Sun may lend  
 His influence from the East ; his radiant heat  
 Should on your House thro' various Windows beat :  
 But on that side which chiefly open lies  
 To the North-wind, whence Storms and Show'rs arise,  
 There plant a Wood, for without that defence,  
 Nothing resists the Northern violence.*

And Cato saith, that a Country House should have a good Air, and not be open to Tempests, and be seated in a good Soil, &c. But I shall advise the planting of shelter on the West and South West, as well as the North ; and that you take care also, that it be well water'd and wooded, that it have a good ascent to it, which makes a House wholesome, and gives opportunity for good cellaridge, and likewise a good prospect is very pleasant according to the variety it affords.

*Contrivance.*

As for the Contrivance which is a thing of great moment in Building, I would perswade every one that begins this VVork, to be well advised in what he doth, because there will be no alteration of things afterwards without a great deal of Charge ; and good Contrivance doth not only make things handsome and convenient, but often saves a great deal of Charges too ; and therefore get a VVorkman that is able to make a good Draught of your Building, as I said before, if your Building is such, as requires no great Curiosity ; but if it doth, a Model will be the most certain way of preventing mistakes in Buildings that require any great Nicety or Exactness ; and as for a Draught, there ought to be in it the Ichnography of each Floor, and also the Orthography of each Face of the Building,



ing, as of the Front, Rear and Flanks; and if the Workman be skilled in Perspective, more than one Face may be represented in one Diagram Scenographically.

But in the Contrivance of all these things, the Quality of the Person is to be consider'd for whom the Building is erected, and accordingly let every thing be design'd, and proportionable lengths, breadths and heighth allowed to each place, with proper and convenient Rooms for what occasions and uses the Owner shall need; only what Draught you make, let it be as large as you can, that so the Ichnography of all Chimneys, Hearths, Jambs, Bed-places, Stairs, and the Latitude of all Doors and Windows in each Floor may be represented; and if you agree by the great for the Workmanship, it will be necessary to insert the length and thickness of the Ground-plates, Breast-summers, Girders, Trimmers, Joysts, Raifings and Wall-plates; and also the thickness of the Walls, Partitions, &c.

In the Orthographical Schemes there should be a true delineation, and the just dimensions of each Face, and of what things belong to it, as Doors, Windows, Balconies, Turrets, Chimney Shafts, *Faciâs*, Architraves, Cornices, and other Ornaments; and if it be a Timber Building, the several sizes of the Ground-plates, Interduces, Breast-summers, Beams, principal Port-braces, Quarters, Window-posts, Door-posts, Cellar-beams, principal Rafters, &c. This care will prevent mistakes and disputes that may arise, especially where you agree by the great.

Having given these Caveats, I shall next proceed to consider the disposal of the several Rooms and Offices, according to the nature of the Building you design to erect.

*Sorts of  
Houses.*

In Building of Houses long, the use of some Rooms will be lost, in that the more room must be allowed for Entries and Passages, and it requires the more Doors; and if a Building consist of a Geometrical Square, if the House be large, the middle Rooms will want Light, and therefore many commend the form of the Roman Capital H, which form, they say, makes it stand the firmer against the Winds, and lets in both the Light and the Air, and disposes every Room near to one another, except you will have a Court in the middle, which was the method of Building of great Houses formerly; but for small Houses I think the Square the best form.

I must here commend the way of Building of Brick Houses with strong and firm Quoins or Columns at each corner, and where any of the principal Beams lie that shall come out half their thickness beyond the rest of the Brick-work, by which means the rest of the Walls between may be much thinner, and a great many Bricks saved; and besides, it adds a handsome Gracefulness to the building: Brick-walls likewise built after the same manner in Pannels, are very handsome, and save a great many Materials.

But according to Sir *H. Wotton's* definition of Contrivance, it consists of these two Heads or Principles, *Gracefulness* and *Usefulness*.

*Gracefulness.*

The Gracefulness or Decency of a Building, he says, consists in two Things. *First*, An Analogy or Correspondency between the Parts and the Whole, whereby a great Fabrick should have great Apartments, great Lights, great Doors, great Staircases, and great Pillars or Pilasters, all which ought to be proportioned to the bulk of the whole Building. And *Secondly*, An Analogy and Agreement between the Parts themselves, as to the Length, Breadth and Height of the Rooms, Windows

dows and Doors, for all which no certain Rule can be given. Though some propose, that a Room ought to be in breadth two thirds of the length, and that it should be as high as broad, and the height of a square Room to be two thirds of it's square; but as to these things, you must be govern'd by the bulk, and the design of the whole Building, as I said before.

Besides which, the heights of Rooms are various amongst us, according to the Persons they are built for; our ordinary Building being but about seven and a half or eight Foot high, the second sort of Houses in the Country are about nine Foot, and the third sort, which is fittest for Gentlemens Houses, is from ten to fourteen Foot.

As for Sir *Henry's* second Point of Usefulness, the Person, and the occasion he hath for his Rooms are to be consider'd: but to determine what number of Rooms must be allowed to a Nobleman's Seat, will require too many considerations to be inserted here; yet for an ordinary Gentleman's Family, a Hall, a great Parlour, with a Withdrawing Room by it, and a smaller Parlour for common Use, with a Kitchen, Butteries and other Conveniences, is sufficient; and underneath where there is a descent that Drains may be made, I am for having of good Cellars and the Dairy; but for the Kitchen in the Country, where there is room enough, I think it better to join it to the House, than either to have it in or underneath it, because of the smells (especially in hot weather) that it sends into the House: and as for the Farm-houses, I think one large Room with a large Chimney in it, to do the chief of their Work in, with a good Parlour, a good Dairy, with good conveniences of Butteries, Cellars, and Out-houses, enough for a Farmer; which several Rooms should be bigger or smaller, according to the bigness of the Farm that belongs to it.



To which Observations, I shall add some general Maxims for Contrivance in Building, as follows,

1. Let not common Rooms be private, as Halls, Galleries, Stair-cases, &c. and let not private Rooms lie open and common, as private Parlours, Chambers, Closets, &c.

2. Light also is a principal Beauty in Building, and the Rooms that respect each particular Coast, ought as near as you can to be accommodated to it, as those Rooms next the South for Winter Rooms, and those that regard the East for Summer Rooms, the North Windows are best for Cellars, Butteries, &c. Rooms that have thorough Lights for Entertainment, and those that have Windows on one side for Dormitories.

3. As for the size of your House, you had better build it too little, than too big, for a large House brings Company and Entertainment, occasions the keeping of a great many Servants, and often requires a larger Purse than is laid up for it.

4. As to the strength of a Building; Country Houses ought to be substantial, and able to encounter all the shocks of the Wind, and not to be above three Stories high, including the Garrets; and observe in working up the Walls, that no side of the House, nor any part of the Walls be wrought up three Foot above the other, before the next adjoining Wall be wrought up to it, that so they may be all join'd together and make a good Bond, or else what is done first will be dry, so that when they come to settle, one part being moist and the other dry, it will occasion it's settling more in one place than another, which causes cracks and settlings in the Wall, and much weakens the Buildings. The Materials also ought to be substantial, and be sure if you build a Brick-building to take care of a good Foundation, and not be scanty in al-  
lowing



lowing Mortar, taking care that all your Brick-work be cover'd with the Tiling, according to the new way of Building, without Gable-ends, which are very heavy, and very apt to let the Water into the Brick-work; the want of observing of which three Things is the common decay of Brick-Buildings.

5. Upon a good Foundation two Bricks or eighteen Inches thick for the heading Course is sufficient for the Ground-work of any common Structure, and six or seven Courses above the Earth to the Water-table, where the thickness of the Walls are abated, or taken in on either side the thickness of a Brick, which is two Inches and a Quarter.

6. But for large high Houses of three, four or five Stories high, the Walls of such Edifices ought to be from the Foundation to the first Water-table, three heading Course of Brick, or twenty eight Inches thick at the least, and at every Story a Water-table, or taking in on the inside for the Summers, Girders or Joysts to rest upon, laid into the Middle or one fourth part of the Wall at least, for the better Bond; but as for the Innermost or Partition-walls, a Brick and a half will be enough, and for the upper Stories nine Inches (or a Brick in length) Wall will be sufficient.

The *Beauty* of a Building consists much in a *Beauty*. regular Form and a graceful Entrance, for Regularity and Proportion pleaseth the Eye; and I think a fair well wrought Front of Brick, pleasanter than one of Stone, which soon loseth its Colour and turns black. The being let through a double Grove of Trees to a House, and to have fine Walks and Gardens behind, and on as many sides of it as you can, is very ornamental.

And let your Offices, Barns, Stables, &c. neither join to, nor be too near your House, especially your

your Stable, which ought always to be a Building by it self, because of the Danger of Fire, upon the Account of the looking after Horses, and the Use of Candles in it.

To which Maxims, I shall add some general Rules to be observed in Building, as order'd by Act of Parliament for the Building of *London*.

*General  
Rules.*

1. In every Foundation within the Ground, add one Brick in thickness to the thickness of the Wall, next above the Foundation, to be set off in three Courses equally on both sides.

2. That no Timber be laid within twelve Inches of the fore-side of the Chimney-Jambs, and that all Joysts on the back of any Chimney be laid with a Trimmer six Inches distant from the back.

3. That no Timber be laid within the Funnel of any Chimney, upon penalty to the Workmen for every Default ten Shillings, and ten Shillings a Week for every Week it continues unreformed.

4. That no Joyst or Rafters be laid at greater Distances from one another, than twelve Inches, And no Quarters at greater Distance than fourteen Inches.

5. That no Joyst bear at larger lengths than ten Foot, and no single Rafters at more in length than nine Foot.

6. That all Roofs, Window-frames, and Cellar-floors be of Oak.

7. That the Tile-pins be of Oak.

8. That no Summers or Girders do lie less than ten Inches into the Wall, nor Joyst than eight Inches, to be laid in Loam, because Mortar is apt to rot all Timber, and therefore some Workmen pitch the End of such Timbers as they lay in Walls.

9. That no Summers or Girders do lie over the Head of Doors or Windows,

10. That

10. That good Oak Timber be laid over Doors and Windows, and that good Arches be turned over them.

Where a House is set upon moist Ground, dig <sup>of Foundations.</sup> the Earth two Foot deep, and after beating of it well, lay a Bed of Mortar, or Cement from either side to the Channel, and then lay a Bed of Cinders upon the Mortar, beat it well, and cover it with another Cement of Lime, Sand and Ashes, this will drink up the Moisture and make it dry. But if the Earth you build on be very soft, as in Moorish-ground, then you must get good pieces of Oak, whose length must be the breadth of the Trench, or about two Foot longer than the breadth of the Wall, these must be laid cross the Foundation about two Foot asunder, and being well rammed down, lay long Planks upon them, which Planks need not lie so broad as the pieces are long, but only about four Inches of a side wider than the Basis or Foot of the Wall, and to be well pinned or spiked down to the pieces of Oak, on which they lie; but if the Ground is so very bad that this will not do, you must provide good Piles of Oak, of such a length as will reach the good Ground, and whose Diameter must be about one twelfth Part of their Length, which must be well drove down with an Engine, and then lay long Planks upon them, spiking or pinning of them down fast.

But if the Earth is only faulty in some places and good in others, you may turn Arches over those loose places, which will discharge them of the weight. Note also, that you must place your Pile not only under your Out-walls, but under your Partition-walls too, that divide the Building, for if they sink, it will crack and damage the Outer-walls too.

**And**

And that you may know the proper Sizes of Timber for your ordinary Buildings; I shall to what hath been said already, add a Scheme of the Proportion of Timber, as agreed to by Act of Parliament for rebuilding of the City, that your Timber may in strength be answerable to the rest of your Building.

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# A SCHEME of the Proportions of Timber for ordinary Buildings.

	F.	F.	In.	In.	F.	In.	In.
Summers or Girders from	14 18 20 to 23 26	16 20 23 26 28	In. must be in their Square	11 13 14 & 16 17	8 9 10 12 14	11½ 10½	8 7 & 6
						In. must be in their Square	3 3 3

Binding Joists, & Trimming from	F. 7 to	F. 11½	In. must be in their Square	6 7 & 8	5 5 5	Wall-plates and Beams of any length. from 15 Foot may have in their Square	In. 7 10 & 8	In. 5 6 6
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Purlines from	F. 15 to 18½	F. 18½ to 21½	In length must have in their Square	9 12	8 9
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Principal Raf- ters cut taper from	F. 12½ 14½ 18½ to 21½ 24½	F. 14½ 18½ 21½ 24½ 26½	In length must have in their Square on one side	In. 8 9 10 to 12 9	In. 5 7 8 9 9	On the other side	6 7 8 8 9
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Single Rafter in length from 6½ to 9½	6½ 9	Must have in their Square	5—3½ and 5—4	Principal Dis- chargers of a- ny length. from	F. 10 upwards	Must have in their Square	In. 13—12 16—13	In.
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Having

Having given you general Directions and Cautions about Buildings: I shall in the next place, give you some general Rules about the valuing of Buildings, and the Materials belonging to them, that you may know how to make some estimate of things of this Nature, without being wholly imposed upon by Workmen, who are in these Cases very apt to abuse whosoever they have to do with, as I said before.

*Carpenters  
Work.*

*Carpenter's Work* is measured by the Square, that is ten Foot each way, or one hundred square Feet; at London they will build a House four Story high for forty Pound a Square, if built with Oak-Timber, and thirty Pound a Square for Fir; that is, to find all the Materials, and all the Carpenters, Bricklayers, Plaisterers and Glasiers Work; and considering the Price of Timber, and Workmanship in the Country, and that the Houses are but three Stories high, and that they have all their Materials laid in, that is, carted for them; I cannot think, but a good House may be built for twenty five Pound a Square in most places, and in some, cheaper.

The Carpenter's Work to frame a House in the Country, where you find Timber, is seven or eight Shillings a Square, if the Carpenter pays the Sawing; if not, 'tis four Shillings and Six-pence a Square.

The Carpenter's Work to build a Barn in the Country that hath one single Stud, or one height of Studs to the Roof, is two Shillings a Foot, but if it have a double Stud and a Girt, 'tis worth two Shillings and Six-pence; that is, to measure one side and one end; as suppose, a Barn sixty Foot long, and twenty Foot broad, that is, eighty Foot; this, the Carpenter's Work to hew the Timber, saw it out, frame it and set it together, will come to at two Shillings and Six-pence a Foot, ten Pound, you finding of the Timber.

*Brick-*

*Bricklayers Work* at London, where a Bricklayer hath two Shillings and Six-pence a Day, a Labourer twenty Pence, and that Bricks are fourteen Shillings a Thousand, Lime Four-pence half-penny a Bushel, and Tiles two Shillings and Six-pence a hundred; for the Bricklayer to find Bricks, Mortar, Scaffolding, &c. for a House, is five Pound a Pole-square, that is, sixteen Foot and a half; but for Walling, four Pound ten Shillings a Pole, if the Bricklayer finds all Materials, is enough; but for his Work only, 'tis one Pound two Shillings a Pole, that is two hundred seventy two square Feet, and a Brick and a half thick; in the Country they will build a Wall for eighteen Shillings a Pole, supposing the Wall to be a Brick and a half thick.

The Bricklayers Work is measured by the Pole-square, that is deducting out all Windows and Doors in the Wall; but if you are to measure a Wall, as suppose, of one hundred and twenty Foot long, and thirteen Foot three Inches high, you must multiply the one by the other, and it will make 1590 Foot, which divide by 272½ makes five Poles, or Rods, three fourths and forty two Feet; but if 'tis more or less than a Brick and a half thick, you must reduce it to a Brick and a half by multiplying the length, and the height by the Number of half Bricks that the Wall is in thickness; dividing the Product by three, and the Quotient by 272½. Chimneys are commonly done by the Hearth. And note, that one Brick and a half thick is fourteen Inches, two Bricks is one Foot and a half, and that four thousand five hundred of Bricks will do a Pole-square of Walling one Brick and a half thick, and twenty five Bushels of Lime where the Sand is good, that is, where 'tis of a large rough Grain, and not mixed with Soil.

*Tiling* is measured by the ten Foot-square, the Workmanship of which is three Shillings and Six-pence

pence a Square in the Country, to find all but Tiles, is twelve Shillings, and to find Tiles and other Materials is one Pound six Shillings a Square. Three Bushels of Lime will do a Square of Tiling, but I prefer Loam and Horse-dung mixed together, and laid about the Middle of the Tile, so as not to touch the Pins or Laths, nor to be so near the point as to wash out, because Lime is too corroding, being apt to make the Tiles scale, and to grow with Moss.

*Underpinning* for the Bricklayer to dig the Foundation where 'tis a Brick thick, and a Foot deep, is a Penny a Foot, and where 'tis two Foot and a half running Measure, 'tis Two-pence a Foot, and so proportionable.

*Bricks.* Bricks may be made of any Earth that is clear of Stones, even Sea-owse, but all Earth will not burn red. To burn a Clamp of Brick of sixteen Thousand, they commonly allow seven Ton of Coals, twenty hundred to a Ton, or nine hundred of Faggots of about three Foot long, and to some Earth, ten Bushels of Coals to a thousand of Bricks. Bricks ought to be nine Inches long, four Inches and a half broad, and two Inches and a half thick; a Yard square of Clay will make seven or eight hundred of Bricks, and the Workmen have commonly six Shillings a thousand to make them.

*Plasterers.* The *Plasterer's* Work is commonly done by the Yard square, for Lathing, Laying and Setting is Eight-pence a Yard, rendring on a Brick-wall is Three-pence a Yard, stopping and whiting one Penny half-penny a Yard, whiting a Penny a Yard; but Lathing, Laying and Setting with Oak-Laths is ten or twelve Pence a Yard.

To daub a Partition-wall with Clay on both sides is Three-pence a Yard, and to rough cast it  
without



without, and render it on the inside Four-pence a Yard in the Country.

Heart-Laths of Oak are one Shilling and Ten-pence a Bundle or Hundred.

Sap-Laths of Oak are one Shilling and Eight-pence a Bundle.

Fir-Laths are Twelve-pence a Bundle.

A Bundle of Laths they reckon will do a Square of Tiling, and five hundred of Nails.

*Sawing* of Timber is from two Shillings and Eight-pence, to three Shillings a Hundred, which they measure in the Middle of the Tree, and suppose a Board to be ten Foot long, and one broad, once cut is reckoned so many Foot.

*Thatching* with Straw is done from two Shillings and Six-pence, to three Shillings a Square, and with Reed for four Shillings a Square: Two good Load of Straw will do about five Square, the Square being a hundred square Feet; and a Thousand of Reed will cover three Square of Roofing, which costs about fifteen or sixteen Shillings, both which Thatching most tie on with Withs, but old pitched Ropes unwound, are much cheaper, and more lasting to tie them with.

*Cellars*, Foundations of Buildings, &c. are commonly done by the Yard solid, which contains twenty seven square Feet, which is usually counted a Load; and therefore the Dimensions being given in Feet: Multiply the length by the breadth, and the Product by the depth, dividing the last Product by twenty seven, the Quotient will give the content in solid Yards.

*Glasier's* Work is done by the Foot-square, *English* Glas is Six-pence a Foot, *French* Glas one Shilling, and Crown Glas one Shilling Six-pence a Foot; to take down a Quarry of Glas to scowre, foder, band, and to set it up again, is three half-pence a Foot.

**Chap. II. Of Mills.**

**I**N Ancient Times they bruised their Corn in Mortars, since which tedious way, Mills have been invented, some to be turn'd by Hand as Querns, others to be moved by Horses, others by Wind, and others by Water; which last being maintained with least Cost, and being most certain and most advantageous, hath gained the Preheminence, and is made use of in most places where Water is fit for that purpose, and where there is imployment. Which altho' 'tis a little for the ease and convenience of near Inhabitants, and for the particular Advantage of the Owner; yet 'tis a very great Detriment and Damage to the Kingdom in general, by the injurious obstructing of the Water, to the spoiling of a great deal of Meadow-ground, and by the preventing of the Advantage that might be made by over-flowing of Land, which upon the removal of the Mills might be done, and the Corn as well ground, either by Wind-mills, which grind twice the Quantity in an Hour, and may be erected on Hills, or in the Plains on any open Places, even where the Water-mills stood. Or by the Rectification of Water-mills, that a less Quantity of Water might serve them; to which end, many have made very ingenious Attempts; and without question, much might be done in it, both in the framing and ordering the Water-works, and in the Contrivance of the Mill it self, which doubtless goes much heavier by the Stone, they call the Runner, its being so large, and being encompassed with a Hoop or Case that keeps the Meal to the edge or circumference of the Stone, and much deadens its motion: for the larger the Runner is, the heavier it moves, which may in some measure be remedied, by making four or five Vents or Passages

Passages in several Places of the Hoop, to take off the Meal as fast as it is ground, that none may lie to clog the Runner.

Or a Mill may probably be so contriv'd, that the Grinding-stone or Runner may be vertical, and of but a small Circumference, the flat and square Edge whereof may be fitted into another fixed Stone, cut hollow about the Half or Third-part of a Circle, which Runner by its first Motion may dispatch as much Corn in the same time, as a larger the other way. Several also of these vertical Stones may be placed on the same Axis, and may be used in all sorts of Mills.

But considering the Ill-name of the Millers (which I wish they did not so much deserve) and the Reasons before given, I believe Hand-mills would be of much more advantage, both to publick and private Families, one of which sort for the grinding of Malt, I have given you already; and I could wish that others of the same kind for other sorts of Corn might be found out, or those sorts which are already found out more improved, and be made more lasting than they are.

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*Chap. III. Of several Sorts of Works belonging to Husbandry, computed according to the Workmen's Wages of Fourteen-pence a Day in Summer, and Twelve-pence a Day in Winter.*

**O**F *Plowing and Harrowing.* A Man cannot well *Plowing and Harrowing.* plow in stiff Grounds above an Acre in a Day, of Lays or Land the first time 'tis fallowed, but where Land is broke up already, if the Land is not miry, he may plow an Acre and an half, and in sandy light Lands two Acres. In stiff Clays they may plow and sow one Acre of Wheat, and

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an Acre and a half of Barly or Oats, and in light Lands double as much with one Team of Horses; but an Ox-Team cannot do above Two-thirds of that Quantity.

The Price for plowing of Land is five Shillings an Acre, and one Shilling an Acre for harrowing; but if 'tis Land not plowed before, 'tis worth seven Shillings an Acre. The charges of keeping an ordinary Team of Horses, where Oats sell for ten Shillings a Quarter, and Hay at twenty Shillings a Load, the Countrymen reckon about fifty Pounds a Year.

*Reaping  
and Mow-  
ing.*

*Of Reaping and Mowing of Corn.* A Man with a Binder may reap an Acre of Wheat, and something more of Rye in a day, if it stands well; and of Pease, Vetches, &c. two Acres: For making up of Sheaffs of Oats or Barly, one Man will bind as much as another can mow, and that from two to four Acres in a day, if thin.

The Price of Reaping and Binding of Wheat by the Acre, is five Shillings; of Rye four Shillings; to mow Oats, is one Shilling an Acre, and to make them fit to Inn is one Shilling an Acre more; to do the same for Barly is worth one Shilling and Three-pence an Acre.

*Thrashing*

*Of Thrashing of Corn.* A Man may thrash four Bushels of Wheat or Rye, six Bushels of Barly or Oats, and five Bushels of Beans and Pease in a day, if the Corn thrash well.

*Price.*

The Price of Thrashing of Corn, is for Wheat, from Three-pence to Four-pence a Bushel; for Rye from Two-pence to Three-pence; for Oats from Fourteen-pence to Sixteen-pence a Quarter; and for Barly the same.

*Of Digging of Land.* A Man may dig four or five square Pole in a Day of Garden-ground, a Spit deep, that hath been dug already; and he may dig three Pole or more to fill into Wheel-barrows, and



and something better than two Poles into Carts, if 'tis good digging Ground.

The common Price for digging of Garden-ground is Four-pence a Pole, because they expect better Wages for Garden, than other Work, else Three-pence a Pole is good Wages. To dig Ground a Spit deep, and to fill it into Wheel-barrows is worth Four-pence a Pole, and into Carts Six-pence a Pole.

*Of Hedging and Ditching.* A Man may Ditch and Quick-set a Pole or more in a day, where the Ditch is three Foot wide, and two Foot deep.

A Man may make a Hedge five Foot high, and bind it well, and lay it thick, and do two Pole in a day; if lower, he may do double.

The Price of Hedging and Ditching, to make a Hedge and lay the Quick is Three-pence a Pole.

To make a Hedge and cleanse a Ditch, the common way is Five-pence a Pole; but if he plash it well, and cleanse the Ditch two Spit deep, and sets it with Quick where any is wanting, 'tis worth from Six-pence to Eight-pence a Pole.

To lay a Hedge and bind it well, and to make a new Ditch of three Foot wide, and two Foot deep is Twelve-pence a Pole.

To make a new Ditch three Spit or two Foot deep, and three Foot broad, is Twelve-pence a Pole, and in very stony Ground, Fourteen-pence a Pole; and the Workmen find Quick and plant it and make a new Hedge with Bushes.

*Of making of Banks.* They are measured by the Float or Floor, which is eighteen Foot square, and one deep, which contains twelve Cart-load in good Mould. A Man will fill into Wheel-barrows a Floor and a half in a day, which will require three Men to carry away in Barrows, and one to trim and ram the Earth.

Note, that of what depth and breadth you make your Ditch, the Bank will be near of the same height and breadth.

In the Marshes they dig a Ditch ten Foot wide at the top, and six in the bottom, and four Foot deep, at two Shillings a Pole, reckoning twenty one Foot to the Pole.

To measure a Ditch, take the length, and for the breadth see how wide 'tis at the bottom and at the top, and half it; as suppose a Ditch six Foot wide at the top, and four at the bottom, which makes ten Foot, the half of which will be five Foot; which multiply by the length, and you have the Contents of the Ditch.

*To mow Grass.* A Man may mow in a day an Acre of Meadow; but if it stand well and be even, he may mow an Acre, or an Acre and a half; and if 'tis Up-land Meadows, and the Grass thin, he may mow two Acres in a day.

To cut Grass, and to make it Hay fit to carry in, is worth in Meadows five Shillings an Acre, and in Up-lands from three Shillings Six-pence to four Shillings an Acre.

#### *Chap. IV. Of the Charges and Profit of Farming.*

**T**HEY commonly allow a Farm to make three Rents, one for the Landlord, one for Charges, and one for the Tenant to live on; but 'tis but few Farms that will constantly afford that Increase, or be maintained for that Charge; indeed, if you take a Farm of 100 *l. per An.* if the Land is worth 20 *s.* an Acre, 100 *l.* may defray the Charges of it: but if the Land of a Farm of 100 *l.* a Year, is worth but 10 *s.* an Acre, you must allow 120 or 130 *l. per An.* for Charges, and you

you must reckon 250 Acres of such Land to 100 l. a Year, or you will lose by it, unless 'tis very improveable Land.

But there being great Variety of Lands, and particular Charges that attend some Lands more than others, which will require the Farmer's utmost Care, Diligence and good Husbandry, and which would take up more room to particularize, than I have to do it in; I shall rather refer him to proportion things as near as he can, according to Mr. Tuffer's Directions, as he hath summed up the Charges of Farming, with which I shall conclude this Part of Husbandry.

1. One part cast forth for Rent due out of hand,
2. One other part for Seed to sow thy Land;
3. Another part leave Parson for his Tythe,
4. Another part for Harvest, Sickle and Scythe.
5. One part for Plow-wright, Cart-wright, Knacker and Smith.
6. One part to uphold thy Teams that draw therewith;
7. Another part for Servants, and Workmens Wages lay,
8. One part likewise for fill-Belly day by day:
9. One part thy Wife for needful things doth crave,
10. Thy Self and thy Children the last part would have.

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## BOOK XI.

Chap. I. Of the Benefit of Raising, Planting and Propagating all Sorts of Timber, and other Trees useful either in Building, or other Mechanick Uses.

**W**HEN we consider that Trade, Riches and Strength are inseparable, and that their great Dependence is upon our Na-

vy, we might have hoped so great a Concern to the Nation should have occasioned a greater Care in propagating and preserving of Timber, which is of principal Use to support it. And though we cannot expect to find many in this Age publick-spirited enough to have such regard to the general Good, as to prefer it before their private Interest; yet the particular Profit that Timber brings to the Owners of it, as well as its Advantage to the Publick, might, if it had not caused more Care in propagating of it, have at least prevented those that have had opportunities of experiencing its Advantage, from making that destruction and general spoil that hath every where of late been made of Woods; had they kept particular Accounts of the Profit, or been able to make a true Judgment of their own Advantage, which, I think, in most places to exceed that of the Plough, or most other Sorts of Husbandry, where the Soil and other Circumstances are proper for such Improvements, without a due consideration of which, no great Advantage can be expected from this, or any other Sort of Husbandry; for tho' Art may improve Nature, yet the forcing of it commonly requires more Cost and Labour than will turn to the Advantage of the Undertaker. And therefore, as 'tis from an Application of such things as are agreeable to each other, that Profit must proceed, I shall endeavour according to such method, to give the best Information I can, of such things as may be most for the advantage and encouragement of the Planter and Farmer.

And therefore, as Trees are of several Sorts, and for several Uses, as some for Building, Utensils, and Fuel; and others for Fruit, Ornament and Pleasure; and that some are raised of Seeds, as the Oak, Chesnut, Ash, &c. and some spring from the Roots, as Elm, Alder, and others; and some are raised  
of



of Setts, as VVillow, Oziers, and the like: and considering that some Trees, even those that are the most useful, have been but lately cultivated amongst us, and that there are more that will deserve the care of our Propagation, I shall not tie myself up only to the common Sort, but add something for the Improvement of such kind of Trees, as may be of Use, tho' not commonly known amongst us, that so there may be an Improvement of the Species, as well as of the way of ordering of them, which work, though 'tis so well perform'd by that Learned and Ingenious Gentleman Mr. *Evelyn*, that it may justly be thought needless for me to meddle with this Subject; Yet as the design I first propos'd, was a compleat System of Husbandry, and that there are several things for the Improvement of this part of it, that I could not otherways have had an opportunity of mentioning and getting Intelligence about, that I think none have treated of yet, I was upon this account under a necessity of making a small Treatise of this Subject. pursuant to something of a different method, than hath hitherto been done; What I shall meddle with being but a small part of what Mr. *Evelyn* hath done, I shall take care in the following Design to avoid as much as I can, what may any ways be prejudicial to one that deserves the chief Honour of so useful a Subject, he having been the only promoter of this advantageous part of Husbandry.

For the Propagation of Trees, I shall not recommend the waiting for a spontaneous Product, except where the Ground is very full of Roots and young Wood, because of the length of time that such Production requires, and because that neither planting nor sowing are any hindrance to it; nor shall I determine in this place which is the best way of raising of Trees by Seed or by the Trans-

Transplantation of such, as we find to have raised themselves from the Seed, or that spring from the Mother-roots of other Trees, because I shall have an occasion to mention it hereafter, and to give an account of several particular Experiments relating to each several way. I begin with the raising of Trees by Seed, as being what must of necessity be the first Work in most places, because other Trees are not to be had to make Plantations with; in order to which, it will be necessary first to treat

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## Chap. II. *Of the Soil.*

**W**Hich being the Foundation of this Work, and there being such a vast difference between the growth of some Woods and others, upon the account of the Ground they grow upon; it may be necessary (tho' I shall have occasion hereafter to treat of the particular Soil that each Plant requires) to premise some general Rules concerning it; for though Trees will many times thrive on coarse Land; yet the best Sort of Lands for most Trees is the deepest and richest Soil, which always produces the Tallest Trees, all Trees commonly growing shrubby, unfruitful or spreading of their tops; where the Soil is either dry or shallow: And tho' some Trees covet to run just under the Surface, yet I think 'tis generally occasion'd from a want of depth of Earth: and where there is not a sufficient depth to cool the Roots and keep them moist, they are neither lasting nor prosperous, though some Trees, as Beech, Hazel, Holly, &c. affect gravel and sandy Land, and Aquaticks moist and boggy; yet for the most profitable and useful Timber, 'tis necessary to have a deep Soil, and in such places Trees do no hurt to the Land  
by

by sucking of the heart away from any thing that shall be sown upon it. However, I am not for imploying of Land worth twenty or thirty Shillings an Acre for this use, farther than by planting of the Hedge-rows, because many sorts of Lands not worth above five or ten Shillings *per* Acre, are near as good; nay, there are some sorts of Lands that are not very good for either Corn or Grass, that will bear very good Trees, as some of the hazelly Brick-earths in *Essex*, and some sorts of heathy Lands. If those that have opportunities of making any particular Observations about the Nature of such Soils, and of the growth of the Trees upon them, will send them to the Publishers, I shall take care to add them in my second Volume, and make such use of them, as I believe will be of publick Advantage. Some Earths have a good Soil above, and underneath Gravel, Sand, Stones, Slate, cold barren Clays, and cold Springs, &c. a Planter or Raiser of Trees ought to consider the under Soil, as well as the superficies of the Earth, and to observe that the worse your Land is, the worse it will be for transplanting; and therefore the raising of Trees by Seed on barren Lands is much to be preferred, because it allies them to it, and makes both the Plant and the Soil the more natural to each other; but seeing all sorts of Land shew what they are inclined to by their natural Product, and what the profit will be by the growth of the Trees, and the Shoots they make, it will be best to sute your Seeds, and your Soil one to another, and likewise to calculate your profit by the same Rule. Tho' even in this Case, too great Additions and Helps may be afforded to Nature with a little cost and labour, as I shall have occasion to shew hereafter.



## Chap. III. Of Seeds.

**C**Huse such Seeds as are mature, ponderous and sound, and that easily shake from the Boughs being taken from the tops of the youngest and most thriving Trees, and gathered when they are ready to fall, which doth for the most part direct the best time for the sowing of them, (which for most sorts of Seeds is about *November*) except your Land is very cold or moist, there a vernal sowing may be better; Acorns, Mast, and other Seeds, being what may be kept well for the Spring Season, by being barrell'd or potted up with moist Sand or Earth, and laid S. S. S. during the Winter, at the end of which, you will find them sprouted, which being committed to the Earth by a careful hand, will be as apt to take, as if sown earlier; and by this means better escape the Vermin, who are very greedy of spoiling the Winter sown Seed, and they are not so easily damaged by the increasing heat, as those sown in the beginning of Winter, especially in loose hot Grounds; and therefore, if you have occasion to preserve much Seed, chuse a fit piece of Ground, and with Boards raise it three foot high, and lay the first lay with fine Earth about a foot thick, and another lay of Seeds, Acorns, Mast, Keys, Nuts, Haws, &c. promiscuously or separated with a little Mould sprinkled amongst them, and let the third, or upper lay be of Earth or Sand, or you may bury the Seeds in dry Sand or pulveriz'd Earth, either barrell'd or laid in heaps in some deep Cellar to preserve them from the rigour of the Winter. If your Seeds be gathered in moist weather, lay them a drying, and so keep them till you sow them, which may be as soon after *Christmas* as you please; but if they spire out before you sow them, be sure to



to commit them to the Earth before the Sprouts grow dry.

As for the medicating or steeping of Seeds, or the enforcing or enriching of the Earth by Compost, &c. for Trees of this kind, 'tis a charge that would much discourage the Work, and what is needless, because if one sort of Mould be not proper for one kind of Tree, it may be for another; but if your Seeds or Kernels prove extraordinary dry, if you lay them twenty four hours in Milk or Water, only impregnated with a little Cow-dung, it may do well to forward their sprouting, especially if you have been hindred from the former Preparation.

The shape and weight of the Seeds inform you which are the best, and how they may be set, most of them, when they fall, lying on one side with their small end to the Earth, from which part they put forth the Root first, which when it hath laid hold of the Ground, from the same place sends forth the Shoot for the Tree; and if they be heavy Seeds, sow them the deeper, as Acorns, Chesnuts, Walnuts, Peaches, Apricocks, &c. about two or three Inches deep: But if light Seed, as Elm, Lime, &c. cover them only with a little Mould about half an Inch deep.

*What Seed is best.*

Being thus provided with Seeds of all kinds, you may raise Woods or Groves immediately from them, which I think the best way, where you design a large Plantation, and resolve to imploy the Land for no other use, and to keep it well fenced. First, because they take soonest; secondly, because they make the straightest and most uniform Shoot; thirdly, because they will neither require staking nor watering (which are two very considerable Articles) and lastly, for that all transplanting (tho' it much improve Fruit-trees) unless they are taken up the first Year or two, is a considerable impediment

*Of raising Trees of Seed.*

diment to the growth of Forest-trees, unless where they are removed from a very barren Soil to a rich, and meet with a very moist Summer, especially in the transplanting of the Chesnut, Walnut, and some others, that I shall have occasion particularly to mention afterwards; but if you design a Transplantation of Trees, it is best to raise them in your Seminaries and Nurseries first; by which means you may transplant them as you please, for Coppice-ground, Walks, Hedges, Rows, &c. therefore I shall refer what I have further to say about the raising, transplanting and managing of them, to the particular ordering of them in the Seminary and Nursery.

#### Chap. IV. *Of the Seminary and Nursery of Forest-trees.*

**F**OR a Seminary or Nursery of Forest-trees, which is what I only design to treat of here, it is what will be thought by many not worth the taking of Pains about; but the small cost that attends it, and the small Quantity of Land requisite for such a Use, with the advantage you will find by it in filling up your Hedge-rows, and other wast uncultivated places will quickly convince you of it's usefulness, and therefore having made choice of your Seeds, chuse out some fit piece of Ground that is well fenced, respecting the South East, rather than the South, and well sheltred from the North and West. Let it be cleared of all trumpery, and if large, it may be plowed up first, because it will make it dig the easier, and after that, I would have it dug up two Spits deep, and all the upper part or surface of the Earth cast undermost, and the under Spit laid above, where the Soil is deep enough to bear it; which tho' it may be a charge at first, it will abundantly answer in the growth of

of

of Trees afterwards, because they will every where have loose Earth to root in, and the best of the Soil under them, all Trees shooting of their Roots most downwards, which is the only way I would have Trees advanced in their growth in Nurseries, and not by mending or improving of the Land by Dung, &c. as the Gardiners commonly do for their own profit, and not the buyers, because of the difficulty that you will meet with in making such Trees to grow, if you should have occasion to remove them to a worse Soil: and if your Nursery be dug up the Winter before you sow or plant it, so as to give a Winter and Summer fallowing to make it mellow and fine, it will do well. At one end or side of which, make some small Beds of about a yard wide, leaving a small path between them for the Seminary; cross the Beds, make some small Trenches at about a Foot distance, into which throw the Seeds, but not too thick, covering them with a Rake, according to the depth before directed; but if you design the raising of Oaks, Walnuts, Chesnuts, &c. the best way is to set them as they do Beans, and at about a Foot distance, which is to be done about the latter end of *October* for the Autumnal sowing, and in *February* for the Vernal; six Bushels of Acorns will sow or plant an Acre of Land at a Foot distance, which I think enough in the Seminary, because they should be weeded by hand, and the spaces between the Beds will give room enough to come at them.

When your Plants begin to peep, Earth them up, especially after great Frosts, at which time, the swelling Earth is apt to spue them forth, and when they are about an Inch above Ground, you may in a moist Season draw them up where you find them too thick, and set them in such places as you have occasion to bestow them in.

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Your Seedlings having stood till *June*, bestow a weeding or a slight howing upon them, and scatter a little mungy Straw, Fern, rotten Beans, &c. amongst them, to prevent the Roots from scorching, and to receive the moisture that falls; and in *March* following, by which time it will be rotten, chop it to pieces, and mix it with the Earth, which continue to do for two or three Years successively, for till then, the substance of the Kernel will hardly be spent in the Plant: after which you may transplant them as you please, only the younger they are removed after they are three Years old, the better they will grow. At the removing of them you must consider whether the place you design them for, be secure to keep Cattle from them while young; but if not, and you design to plant them where Cattle come, it will be best first to remove them into your Nursery, where you may plant them in Rows three Foot distant, and the Trees in the Rows to be at least two Feet distant from each other, because else you will be apt to cut the Roots in taking of them up, in these Rows you may let them stand till they are big enough to plant out, so as by the help of some Stakes or Bushes put about them, they may in a short time be able to defend themselves from Cattle, the not taking care of which particular has been a great discouragement to several Planters. Some at the first transplanting of their Trees out of their Seminaries cut them off about an Inch from the Ground, and plant them like Quick; but it's not a good way for any sort of Trees that have a large Pith, or that you design for Timber-trees, because it lets the Water into the one, and spoils the Butt-end of the other, which is the principal Part of the Tree, by diverting the Pith, and by consequence, the Grain of the Wood too, and so hinders it from running clear if you should have

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occasion to cleave it into Lathes, Pales, &c. and therefore I am only for pruning up the side Boughs; but about the Transplantation of Trees and the pruning of them, &c. I shall have occasion to take notice afterwards; only you must observe, that having transplanted your Seedlings into a Nursery, they ought still to be kept clean from Weeds, and also the Ground to be kept loose, that the Roots may spread the better, and therefore in the next *Autumn*, before the Leaf is off, your Nursery ought to be digged a small Spit deep once a Year, only in Spring or Summer you must pull or hove up the Weeds as need requires; and I propose the digging amongst the Trees, while the Leaf is on, because if it be done while the Sap is up, if a Root should happen to be cut it will shoot out again, perhaps two for one; but after the Sap is once down, if a Root be cut it will not shoot forth that Winter; however be not too early in the Season, nor yet too careless of the Roots; and between the Rows you may plant Beans, Pease, or sow them with Turneps to prevent Weeds from coming up, which if any do, they should be howed up in *June*, and laid about the Roots of the Trees to rot and to keep them moist.

Many Trees may also be propagated by Layers, *Trees of Layers.* the Ever-greens about *Bartholomew Tide*, and other Trees about *February*, which is done by flitting of the Branches a little way, and laying of it half a Foot under Mould, with which, if some of the Earth that is in hollow Trees be mixed, or some Pigeons Dung, or if you water the Layers (where 'tis Plants that you are curious of) with the Grounds of Beer or Ale, it will make them strike Root the better; and if it comply not well, peg it down with a Hook or two, and when you find it compleatly rooted, the next Winter cut it off from the main Plant, and plant it forth in  
Y your

your Seminary or Nursery, as is before directed about Seedlings ; others twist the Branch or bare the Rind, and if 'tis out of the reach of the Ground they fasten a Tub or Basket near the Branch, which they fill with good Mould, and lay the Branch in it.

*Trees of  
Cuttings.*

Some Trees are raised of Cuttings taken from the young Shoots, the best of which are those Suckers that spring from the Roots ( except 'tis a grafted Tree that you design to have Cuttings from ) the Cuttings must be set a Foot deep in the Earth in a moist shady place, as near as you can, and stand near a Foot out ; but if they are of soft Wood, as Willow, Poplar, Alder, &c. 'tis best to take large Truncheons, so tall as that they may head above the reach of Cattle ; but if you raise your Trees of such sorts as bear a Knur or burry swelling, set that part into the Ground, and make the hole wide, pointing the end of the Cutting so smooth that no part of the Bark may be stripp'd up in setting ; and keeping the Ground moist about it, it will seldom fail of putting out Roots and growing.

*Trees raised by  
Suckers.*

Many sorts of Trees may be propagated from Suckers coming from the Roots of other Trees, to cause which, dig about their Roots early in the Spring, and finding such as with a little cutting may be bent upwards, raise them above Ground three or four Inches, and in a short time they will send forth Suckers fit for transplantation ; or you may split some of the Roots with Wedges, or break them, &c. and covering of them with fresh Mould they will quickly sprout out, which is one of the best ways of raising Elms and some other sorts of Trees ; but these things I shall particularly mention hereafter.

Chap. V. Of the Oak.

I Shall begin with the Oak, as affording the most useful and best sort of Timber, especially for the building of Ships, and what was of all others the most esteemed amongst the *Romans*, of which there are several species in several parts of the World; but Mr. *Evelyn* takes notice only of four sorts, two of which he reckons the most common in *England*, viz. the *Quercus Urbana* which he esteemeth the tallest, being clean and of a smooth Bark; and the *Robur* or *Quercus Silvestris*, which hath a kind of a black Grain and bears a smaller Acorn, spreading forth its Roots and Branches more than the other and keeping of its Leaves all Winter; these differences I know variety of Soil will produce, and that the more thriving an Oak is the more sappy it will be, and the longer the Leaves will hang on it; and therefore whether these marks are distinguishing of the Species I shall not determine, but rather advise the gathering of your Acorns from such a Tree as you like the kind and sort of best.

The Oak may be propagated by Layers, but not to that advantage of bulk and stature as from the Seed; nor can it be so well transplanted as it may be raised from the Acorn: but where you design transplanting of them for Walks, Groves, or into Hedge-rows, or other places where Cattle come, they should be often transplanted; and the best way to make them bear, is to raise them first from Acorns in your Seminaries, and after three Years growth to transplant them into your Nursery, ordering them as is shewed already, where you may let them stand seven or eight Years, or till they are about seven or eight Foot high according to their bigness and growth, and then re-

How raised.



move them, as you have occasion, without which care, most Trees are very difficult to remove that are raised of Seed; the reason of which is, because 'tis the nature of all such Trees to put forth one down-right Root first, and not the side Roots till the Tap-root is got near the bottom of the Soil, especially in a loose hollow Ground, and so the main Roots going deep the small Roots, which are the chief nourishers of the Tree, lie so deep that you cannot come at them to take them up, but, if you take them up young, while the Tap-root is small and not shot too far down, you may by cutting off the Tap-root about a Foot long, cause it to branch near the Top of the Earth, which will give you the advantage of taking of it up with small Roots when 'tis removed again.

But some, to prevent this inconveniency, put under all the Trees they raise of Seed about three or four Inches below the place where they sow their Seeds, a small piece of Tile to stop the running down of the Tap-root, which occasions it to branch when it comes to the Tile, which is a very good way, and will much increase the number of the small Roots, and is a great help to its transplantation, and many say, that it much helps a Tree where 'tis not removed, but suffered to grow from the Seed.

*Removing  
of them.*

The best time for the removing of Oaks and all other Trees that shed their Leaves in Winter, is in *October* as soon as the Leaf begins to fall, or in *February* just before the Sap begins to rise, and take care in planting of them not to set them deeper than they stood before, for if the Roots be sufficiently covered so as to keep the Body steady and erect 'tis enough. The Position likewise of the Tree ought to be carefully observed, for the Southern side of the Tree being more dilated and the Pores more exposed to the heat of the Sun



Sun by a sudden transposition of the Tree in a cold time of the Year, the Tree will be much prejudiced.

The Oak thrives best on the richest Clay, tho' it will grow well on moist Gravel or the coldest Clay, which most other Trees abhor, and even in some places strike Root between Rocks and Stones, and grow almost upon any kind of Land: but the best Timber for Ships is that which grows on the stiffest Land, it being the most solid, tough and durable; whereas what grows on light Land is light and brittle, and not of a solid Grain, which tho' 'tis best for the Joiners use, is not of the value of the other for Ships and Building; but 'tis in the most Southern warm parts of *England* that they thrive best in stiff Clay, and not so well in the Northern parts, because they have not so much the heat of the Sun to warm those cold Soils; for Oaks, as to the Soil and temperature of the Air, as *Vitruvius* well observes, neither prosper in very hot Countries nor very cold, but affect a temperate Climate, which I suppose is the reason of our *English* Oaks so much out-doing those of all other Countries: and where Oaks grow naturally and in abundance, it is a sign of their being good and their liking the Soil.

*Sail.*

If you would propagate them for Timber, do not cut off their Heads, nor be too busie in lopping of them, except it be of fear and unthrifty Branches, or that you are to remove them from a good Soil to a bad, in which case 'tis necessary to have as much Root and as little Top as you can, or that you desire them for Shade, bearing of Mast, or for Fuel.

'Tis needless to mention either the usefulness of *its Uses.* Oak for the building of Houses and Ships, or to shew how much our *English* Oak exceeds that of all other Countries for that use, some of it being so

tough that our sharpest Tools will scarcely enter it, nor the Fire it self consume it but slowly, as having something of a ferruginous metalline shining nature, proper for robust uses: it is doubtless of all Timber hitherto known the most universally useful and strong; for tho' some Trees be harder, as Box, Cornus, Ebony, and divers *Indian Woods*, yet we find them more fragil, and not so well qualify'd for the support of great weights, nor any Timber so lasting where 'tis to lie sometimes wet and sometimes dry. The fine clear grained Oak, if it be of a tough kind, is best for the support of Burdens, as for Columns, Summers, &c. and the more tender sort of a fine clear Bark, as being the best to cleave, is the most useful for Pales, Laths, Coopers Ware, Shingles, Wainscott, Wheel-spoakes, Pins, &c. as the knottiest and coarsest is best for Water-works and Piles, because it lasts longest and drives best; and the crooked Oak, if firm, is best for Kneetimber in Ships, for Mill-wheels, &c. And if the planting of Oaks were more in use for Woods it would spoil the Coopers trade for the making of Hoops either of Hasle or Ash, because one Hoop made of the young Shoots of a Ground-Oak would outlast six of the best Ash. The smaller Truncheons and Spray makes Billet, Bavine and Coals, and the Bark is of price with the Tanner and Dyer, to whom the very Saw-dust is of use, and the *Uvæ Fungus's* to make Tinder of. Oaks bear also a kind of a Knur of a cottony matter which was us'd of old for Wicks of Lamps and Candles. *Prævotius* in his *Remedia Selectiora* mentions an Oyl extracted chymically *e quercina Glande*, which continues the longest of any whatsoever, so that an Ounce of it can scarcely be consumed in a Month tho' kept continually burning; and *Mr. Josselin* in his *New England Rarities*, says,  
That

That they there make an Oyl of the Acorn growing on the white Oak by taking of the rottenest Maple-wood and burning of it to Ashes, of which they make a strong Lye, wherein they boyl the Acorns till the Oyl swims on the top in great Quantities, which they put into Bladders to anoint their Limbs with, which it exceedingly corroborates and strengthens, and serves them to eat with their Meat, being exceedingly clear and sweet Oyl; which perhaps is what our Acorns will produce too: if not, I think it would be of use to procure some of those Acorns to plant here, which may be easily done by them that have a correspondency there. *Varro* says, they made Salt of Oak Ashes, and sometimes seasoned Meat with it, but more frequently sprinkled it among their Seed-corn to make it fruitful; and Acorns are of great use for the fattening of Hogs, Deer, Poultry, &c. and formerly served for the Repast of Men too.

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Chap. VI. *Of the Elm.*

**E**LMs are of several sorts, and differ much according to the Soil and Climate they grow in. The sorts most worth our care and culture are, *first*, the common Elm, which hath a very rough Bark and Leaf, some of which are of a rounder form than others; this sort of Tree grows to a very great height and bigness, especially those that have the roundest sort of Leaves. *2dly*, That which they call the Witch-elm, which kind in bigness and height is like to the first sort, only it hath a much smooother Bark, and in many places is putting forth Burrs and Knobs, the Leaf being also smooth and long, and varies much for breadth and length according to the Soil it grows in. The Third sort of Elm is by some called the Witch-hassel

or broad-leav'd Elm, the Body and Boughs of which have a smooth Bark like the Witch-elm, and the Shoot and Leaf is much like that of the Hasle; upon which account, I suppose, it hath its name: The Leaves in some Soils are of a very great size, and where it thrives it will make very large Shoots. I have one of these sort of Elms that I brought out of *Derbyshire*, in my Nursery, that hath Leaves near six Inches long and about five broad, it every Year sends forth Shoots of fourteen or fifteen Foot long, it will grow to a great bigness, being the quickest grower of any kind of Elm, but 'tis not so apt to spire up as the other sorts, being more inclined to branch into Arms.

*How rais-  
sed.*

Elms may be propagated by Seeds, which are ripe about the latter end of *March* or beginning of *April*, which gather and lay in a Room to dry a day or two, and then sprinkle them in Beds prepared with good fresh Earth, sifting some of the finest Mould thinly over them, and water them as need requires. When they are come an Inch above the Ground, which they may do in four or five Months time, sift some more fine Earth about them to establish them, keeping of them clean weeded for the two first Years, and the side Boughs trimm'd up till they are fit to remove into the Nursery to be placed at wider distances, and from thence to be removed to such places as you have occasion to plant them in. But the taking of such up as are of a plantable size from Hedge-rows and Woods is much more easie and expeditious; their not being apt to run down with a Tap-root, like an Oak, makes them more easie to transplant; only those that you take out of Woods, as they stand there very warm, will not thrive so well if they are planted directly into an open place, as if you plant them first into your Nursery for two  
or



or three Years, and from thence transplant them to Avenues, Hedge-rows, &c.

Elms may likewise be produced of *Layers* from *Of Layers*  
a Mother-plant, as is before directed, or from *or Suckers.*  
*Suckers* taken off from the Mother-roots of great Trees after the Earth hath been well loosened from them. Or if such Stubs as have been felled be fenced in so far as the Roots extend, they will furnish plenty of young Plants, which may be transplanted from the first Year or second successively, by slipping of them from the old Roots. I shall not trouble you about the raising of them of Truncheons or Lops, because I could never find them to take; only sometimes some of the smallest Suckers, when the Sap is newly stirring in them, if they are split off from the Tree, will grow, tho' not rooted.

Another way is to sink *Trenches* at ten or twenty Foot distance from Elms that stand in Hedge-rows in such order as you desire they should grow; and where these Gutters are, many young Elms will spring from the small Roots of the adjoining Trees, which after one Year being cut off from the Mother-roots with a sharp Spade, if you transplant them they will prove good Trees without doing any injury to the old ones. *By Trenches.*

There is a fourth way no less expeditious and successful, by baring some of the chief Roots of a thriving Tree within a Foot of the Trunk, and chopping the same with an Ax, or making some small Clefts in them with Wedges, into which Clefts put some Stones to prevent the Clefts closing again and to give Access to the Wet, which cover three or four Inches thick with good Mould; and one single Elm thus managed will be a good Nursery, whose Suckers after two or three Years you may separate and plant out as you see occasion.

The

*Of removing of them.*

The best time for the Transplantation of Elms is in *October* or *February*: Of all Trees that grow there is none that better suffers Transplantation than the Elm doth, for you may remove them of what bigness you will, even of twenty or thirty Years growth; nay, if they are planted in a good Soil, I think those of eight or ten Inches circumference to grow better than smaller ones, provided the Bark be smooth, tender and void of Wens, unless they are removed at the first taking of them off from the Mother-roots, if they are of any great bigness when you remove them. You must totally disbranch them, leaving only the Summit entire, unless the Soil be very good; it may be necessary to head them too, but then it will be convenient, as soon as you can, to leave a leading Branch near the Top to spire up and cover the Wound; for Elm being a soft Wood, the Wet is apt to sink into it and to spoil the Tree. They must be taken up with as much Earth and Roots as you can, and have a great deal of watering; and the sooner they are removed after the taking of them up the better, except you speedily lay them in a Trench and cover them with Mould till you have time to transplant them: They should be planted on the Surface of the Earth, it being a very great Error, in any Soil, to plant Trees deep, and let the Roots be handsomely spread, and the Trees well staked and defended from Cattel: They delight to grow the nearest together of any Trees, which causes them to run up spiring, and protects them from the VVinds.

*Soil.*

The Elm thrives best in a rich black Mould; especially where they can at some depth meet with some refreshing Springs or Moisture, and will grow almost on any Sort of Land; and tho' they thrive not so well in too dry, sandy or hot Ground, or those that are too cold or boggy, yet where the Earth

Earth is a little elevated above these Annoyances, you will find them to thrive upon the worst Land, as may be observed in several bad Soils, where Mounds and Banks are cast up, especially some Sort of Witch-Elms, which in many Places grow on the driest Gravel, tho' not to any great Advantage.

The Elm, by reason of its aspiring and tapering growth (unless it be topped to enlarge the Branches and to make them spread low) are the least offensive to Corn, Pasture and Hedges of any Tree, to which, and the Cattel, they afford a benign Shade, Defence, and agreeable Ornament.

When you would fell them, let it be about *November*, *December* or *January*, after the Frost hath well nipp'd them, and that the Sap is fall'n into the Root, which will cause all Sort of Timber to be more durable and lasting; and if you find them any way unthriving, fell them, and rather trust to their Successors; for the least decay in any part of them will quickly spoil the whole Tree.

But if you have occasion to use them for Firing, rather shred up the Boughs than lop them; the best time for the doing of which is in *February*, and by that means you may cause them to spire up, always taking care to preserve the top, because it protects the Body of the Tree from the Wet which commonly invades that part first, and because of its sponginess the Rain easily penetrates, and will in a short time perish them to the Heart, by which means they will not only yield more Firing than if lopp'd, but Timber too, especially if you take care to shred them up once in ten Years, and that you cut the Boughs close to the Body, or else the remaining Stubs will immediately grow hollow, and serve as so many Conduits or Pipes to hold and convey the Rain to the Body of the Tree; but if you lop any let it be the Witch-Elm, which  
is



is much the hardest and toughest Wood, and bears the best top; or you may form them into Hedges by plashing of them, and thickning of them to the highest Twig, which will afford a magnificent Fence, and be a good shelter against the Winds and the Sun.

*Use.*

Elm is a Timber of extraordinary use, especially in extreams, where it may be continually wet or dry, and therefore proper for Water-works, Mills, Soles of Wheels, Pipes, Aqueducts, Ship-Keels and Planks beneath the Water-line; and also the Witch-Elm, especially if knotty, is good for Wheel-naves, because of their being the toughest Timber, and the strait smooth Elms for Axle-trees, Kerbs for Coppers, Boards, Chopping-blocks, Trunks, Coffins, Dressers, and for Carvers-work, Shovel-boards of a great length and fine colour; and the Roots of the knotty, curled Sort are near as good as Walnut for Cabinets, and are often sold for it, which they colour by laying in a wet Saw-pit that hath Oak Saw-dust in it, where they let it soak for a Month, which gives the Grain of it a black Colour like that of the Walnut-tree; and if Elm Timber, as soon as it is sawn, be put into Water and lie three Weeks, and after the taking of it out be kept dry, it will prevent the Worms eating of it, and cause it to last as long as Oak, nay some Elm-trees found buried in Boggs have turned like the most polished and hardest Ebony, as Mr. Evelyn saith, and were only discernable by the Grain. They make likewise very good Espaliers, if made to comply well with the Frames, and kept constantly clipp'd. Besides which several uses, it makes the second sort of Charcoal, and the very Leaves of it are not to be despised, for being gathered green, and suffered to dry in the Sun upon the Branches, and the Spray stripp'd off in *August*, will prove a great relief



lief to Cattel in Winter, or scorching Summers when Hay and Fodder is dear, which they will eat before Oats and thrive exceedingly with it, but then you ought to lay the Boughs in some dry places to prevent their musting: In some parts of *Herefordshire* they gather them in Sacks for their Swine and other Cattel: but some say they are ill for Bees in that they surfeit of the blooming Seeds, which makes them obnoxious to the lask, and that therefore they do not thrive in Elm-Countries.

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### Chap. VII. *Of the Ash.*

**O**F *Ashes* some reckon that there are two kinds, the Male and the Female, and that the Male affects the higher Grounds, and the Female the lower, which they esteem the whiter Wood and the taller of growth: but I could never perceive any greater difference in them than what the Soil occasioned; but tho' there is not much difference as to the form of the Tree, there is in the Timber, as in that of the Oak, some being much tougher than others, the toughest growing on the stiffest Land; but the best to cleave is that which grows on Gravel, Sand, or other light Lands.

The Ash is best raised of the Keys gathered when they begin to fall, which is about the latter *How raised.*  
End of *October*, and during the ensuing Month, which you must gather and lay by to dry, and then sow them any time between that and the last of *January*; those that are gathered from a young thriving Tree, which produces the fairest Seed, are reckoned the best; they should be sow'd but shallow, an Inch or an Inch and a half being deep enough; or you may sow them upon the top of the Ground and they will come up, but 'tis best not to sow them in frosty Weather, they will lie 'till

'till the next Spring after before they appear, except you have a mind not to wait so long for their springing, in which case you may prepare them for spearing by laying the Keys in Earth or Sand (which is the best) just as you gather them, laying one Layer of Sand, and another Layer of Keys, and then laying another Layer of Sand continuing so to do 'till all your Quantity is disposed of, observing to keep your Sand moist, and in a covered airy place, and the next *January* come twelve-Month after you may sow them, and they will come up the next Spring, but do not let them lie too long uncovered when you take them out of the Sand lest they should spear, and the Air dry and spoil the Shoot. But if you would make a Wood of them at once, dig or plow up a parcel of Land and prepare it as for Corn; only if you plow it give it a Summers fallowing to kill and rot the Turf, plowing of it as deep as you can, and with your Corn, especially Oats, sow your Ash-Keys, and at Harvest taking off your Crop of Corn the next Spring you will find it covered with young Ashes, which by reason of their small growth the first Year should be kept well weeded and well secured from Cattel, who are very desirous of cropping of them, the second Year they will strike Root, and quickly surmount what Impediments they meet with.

*Of their  
removal.*

The best time to remove Ashes is in *October* and *November*; they are best transplanted young because of their deep rooting, which makes them hard to take up when they grow big; but if you would transplant them large, raise them first in your Seminary, and then remove them into your Nursery, and from thence into the places where you design to plant them out, which will be a great advantage in that it will inable you to take them up with good Roots, as I said before of the Oak;

Oak; but as 'tis a Tree that hath a large Pith, you must avoid heading of them if you can, and content your self only with cutting off the side Boughs, which will be better for the Timber, and be likewise sparing of the Roots, except the down-right Tap-root, which you may abate as you see convenient. Some cut the young Ashes off about an Inch above the Ground, which causes them to make very large streight Shoots, which they call Ground-Ash; and 'tis a very good way where you design them for under Wood.

Young Ashes are sometimes in Winter Frost burnt, which makes them look as black as a Coal; you may in such cases make use of the Knife, yet they commonly recover of themselves, tho' it is but slowly.

'Tis no way convenient to plant Ash in plow'd Lands, especially where the Soil is flete, because the Roots are apt to run upon the Top of the Ground, which makes them troublesome to the Coulter, and the dropping of the Leaves is esteemed hurtful for the Corn, and at *Michaelmas* time makes the Butter bitter when eaten by the Cattel: but in Hedge-rows and Plumps they will thrive very well where they may be set at ten or twenty Foot distance; in planting of a Wood of several kinds of Trees for Timber, every third set, at least, should be an Ash, it being a Timber that is saleable at any size.

Ash delights most in a light dry Mould, the richer and fatter 'tis the better, yet it will grow on any sort of Land if it be not too stiff, wet or boggy, tho' on Banks or Rising-grounds near Rivers and running Streams they will thrive exceedingly, or in wet Lands that are well drained.

The Ground-Ash (like the Oak) much excels a Bough or Branch of the same Bulk for strength and toughness, and is a good lasting Timber where

*Soil.*

*Use.*

'tis



'tis kept dry, and the Ends of it not laid in Mortar but Clay or Loam. 'Tis remarkable, that the Ash, like the Cork-tree, grows when the Bark is as it were quite peell'd off, as hath been observed in several Forests and Parks. Some Ash is very finely veined and much prized by the Cabinet-maker, which they often call by the Name of green Ebony, and bring it to its lustre with *China* Varnish. But they often vein it by art, especially for Gun-stocks and such uses, by steeping of filings of Iron in *Aqua Fortis*, with which they draw Veins or improve those that are natural, by tinging of them with this Liquor, which will sink into the very Grain of the Wood, and give a black Colour where-ever you touch the Wood with it.

The use of Ash (next to Oak it self) is one of the most universal sorts of Timber we have, it serves the Soldier, Seaman, Carpenter, Wheelwright, Cooper, Turner, Thatcher, and Husbandman for Ploughs, Carts, Axle-trees, Harrows, Bulls, Oars, Blocks for Pullies, Sheffs; and like the Elm, is good for Mortasses and Tenons, and likewise for Pallisade-Hedges, Hop-Garden-Poles, Pikes, Spars, Handles, Stocks for Tools, Spades, Guns, &c. So that in Peace and War 'tis a Wood of the greatest usefulness; the white and rotten part of it composes a ground for sweet Powder, and the Truncheons make the third sort of the most durable Coal, and is of all other the sweetest of our Forest-fuel, and will burn even while it is green. But the shade of the Ash is not to be endured, because it produces a noxious Insect; and because of the late budding and early falling of the Leaves, and therefore 'tis not to be planted for Walks or Ornament, especially near Gardens, because of their spreading Roots and falling Leaves, both which are prejudicial to them.

The



The season for felling of this Tree is when the Sap is at rest, from *November* to *February*; but in lopping of Pollards, it being a soft Wood, it ought not to be done till Spring, that the Bark may quickly come on to cover the Wound; nor should the Boughs, for the same reason, grow too big, because they will be so much the longer before they heal, and so give opportunity to the Rain to soak into the Tree, which will quickly cause it to decay, so that you must be forced to cut it down, or else both Body and Lop will quickly be but of little Value; and the same thing ought to be done when you see the Wood-peckers making holes in them, or the top Boughs begin to wither or be unthrifty, which is a sure indication of their decay. The Keys of the Ash are a good Pickle while young and tender; and when near ripe, being gathered about the beginning of *August*, they are good to preserve Beer or Ale, I having drank small Beer in Summer-time brewed with them without any Hops in it, that drank well at two Months old; but if some Hops be mixed with them they will do the better.

## Chap. VIII. *Of the Beech.*

THE *Beech* is of two sorts and numbred amongst the Glandiferous Trees; the *Mountain-beech*, which is the whitest and most sought after by the Turner, and the *Campestral* or *Wild-beech*, which is of a blacker colour and more durable.

Both which sorts are raised from the Seeds, and *How raised.* are to be managed like the Oak, which is the best way of raising of a Wood unless you will make a Nursery of them, and manage them as is directed for the management of Ashes. Sow them in *Autumn* or later, or rather nearer the  
Z
Spring

Spring to preserve them from Vermin which are great devourers of them. They may likewise be planted of young Seedlings drawn out of such places as the Seed falling from the Trees doth propagate.

*How removed.*

In transplanting of them, cut off only the Boughs and bruised parts two Inches from the Stem, within a Yard of the top, but be very sparing of the Roots, that is, for such Trees as are of Stature. They make spreading Trees and a fine Shade.

*Soil.*

They will grow on Gravel, Sand or Heathy Ground, either upon the declivities, sides or tops of high Hills, and on Chalk or Rocks, where they will strangely insinuate their Roots into the dryest and hardest parts, and in Vallies where they grow in Confort they rise to a vast height though the Soil be never so stony or barren, if it be but natural to them; but they are very peculiar to what places they affect.

*Uses.*

The Beech serves for various uses of the Housewife, as for Dishes, Trays, Rims of Buckets, Trenchers, Dresser-boards, Screws, Chairs, Stools, Bedsteads, Shovel and Spade-grafts, Floats for Fishing-nets made of the Bark; it is good also for Fuel, Bavin, Felloes of the *London* Cars, and Coal, tho' of the least lasting, not to omit the Shavings of it for the fining of Wine, and the Ashes of it with proper mixtures, is good to make Glass. If the Timber lie altogether under Water it is little inferiour to Elm. Of the thin *Lamina* or Scale of the Wood they make Scabbards for Swords, Band-boxes, Hat-cases, and formerly Covers for Books, &c. Bees delight to hive in the Cavities of these Trees: It is much subject to the Worm, and therefore it will do well, so soon as the Timber is cut, to lay it in Water for a fortnight or three Weeks, as is before directed about the Elm.

The

The Beech being pruned heals the Scar immediately, and is not apt to put forth side-boughs again. The Mast is excellent for the fatting of Swine and Deer, to which Hogs may be drove about the latter end of *August*. Some Families have by the Seed been supported with Bread in some parts of *France*, they grinding of them for that use, and they afford a sweet Oyl. The Leaves gathered somewhat before they are too much Frost-bitten make excellent Matresses to lay under Quilts instead of Straw, because they continue sweet seven or eight Years without being musty or hard, as Straw will be; and they are much used both in *Dauphine* and *Switzerland* for that use.

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### Chap. IX. *Of the Chesnut.*

OF *Chesnut* Trees *Pliny* reckons several kinds, especially about *Tarentum* and *Naples*, but we have but one sort common in *England* that I can hear of. We have Nuts from several parts, the largest and fairest from *Portugal* and *Bayonne*, our own being very small and not so sweet as the former, but the way to have fair Fruit is to graft them.

They may be raised by Layers, but the best way to produce them is by the Nut; for which use choose the largest brown and most ponderous for Fruit, and the lesser ones for Timber. The best way of planting them is like Beans, previous to which, let the Nut be first spread on a Floor to sweat, and then cover them with Sand, and after a Month's time take them out and plunge them in Water, and the swimmers reject. Dry them again for thirty Days more, and then sand them as before; after which try them again in Water, and repeat the same course with them till Spring; at which time, or in *November*, you may

*How raised.*

set them; but if you set them in Winter or Autumn, it is best for to set them with the Husk on, which is a good preservative against the Mice; it is also necessary to keep Hogs from them, who will find them if possible.

Some sow them confusedly in Furrows like Acorns, and govern them like the Oak, but then the Ground ought to be well plowed and fallowed the Summer before, and when they spring, be cleansed at two Foot distance after two Years growth; likewise Coppices of Chesnuts may be wonderfully thickned and increased by laying the tender Branches. Such as spring from the Nut are best, and will thrive exceedingly if the Ground is stirred and loosened about the Roots for two or three of the first Years of their growth, and the superfluous Wood pruned away, which you may esteem most of the side Branches to be: They also shoot into fine Poles from a felled Stem, useful for many purposes.

*How removed.*

Being come up they thrive best unremoved, there being hardly any Tree that bears Transplantation worse, in that they will sometimes upon removal make a stand of four or five Years; and therefore when you design to transplant them I shall not propose the raising of them in a Seminary, and to give them several Removes, as I directed about other Trees, but to raise them at first in your Nursery, where you design to let them stand till you can plant them out into your Grounds; for they do not much run down with Tap-roots, but may be taken up at any time with good Roots, without that transplanting of them that is upon that account necessary for the removal of other Trees; and in the removal of them I am rather for cutting only of the side-boughs, than heading of them. The best time for removing of them is in *November* and *February*; they may be planted at twenty or thirty Foot distance



stance for Timber, and for bearing Fruit at forty, but for other uses a great deal nearer.

I may here bring in the Horse-chefnut, which *Horse chef-* being easily increased by Layers grows into a good-*nut.* ly Standard, bearing a fine Flower, and is now all the Mode for Walks and Avenues in *France*, being at first brought from *Constantinople* to *Vien-* *na*, and from thence to *France*, tho' directly from the *Levant* to our Climate, where it grows very speedily to a large Stature, especially if planted in a rich Soil near Water.

The Chefnut delights most in a light hazel Brick *Soil.* Earth, or black Mould, or moist Gravel, and will grow well on Clays, Sand or any mixed Soil, especially if raised from the Nut without transplanta- tion, and upon exposed bleak places, and the pen- dent Declivities of Hills to the *North*, in dry airy places, and sometimes near Marshes and Waters, where the Water doth not touch the Roots, which when it doth, is very prejudicial both to the Tim- ber and Fruit; but they affect no other Compost save what their own Leaves afford them, the dropping of which makes them injurious to what grows under them. They bear Cold better than Heat.

Next unto the Oak the Chefnut is the most *Use.* sought after by the Carpenter and Joyner for Building; and before the use of *Firr*, was much made use of, many of the ancient Houses in *Lon-* *don*, having been built of it. It affords the best Stakes and Poles for Pallisadoes and Hops, good Props for Vines, and makes extraordinary Hoops, for which use only they keep several Coppices in *Kent* all of Chefnut, near the Water-side, of which they make great advantage by sending of them to *London*. The Timber is likewise good for Mill and Water-works; and the Trees are very good shelter, being set on the North-side of other Plantations,

and for Walks and Avenues. The Timber doth also well for Columns, Tables, Chests, Chairs, Stools, Bed-steads, Tubs and Wine-casks, which it preserves with the least Tincture of any Wood whatsoever: some say, that if the Timber be dipped in scalding Oyl, and well pitch'd, that it will become very durable: It is very apt to decay within when it shews fair to the Eye. The Coals are excellent for the Smith, being soon kindled and soon extinct, but the Ashes are not good for Lee, because they are apt to stain Linen.

As for the Fruit, it is better beat down from the Trees some little time before they Fall of themselves, because they will keep the better, or else you must sinoak-dry them, but not if you design to plant them. And tho' here in *England* they are Food for Swine, yet in other Countries they are much esteemed, and would certainly be more useful and nourishing to our Countrymen than many of the Herbs and Roots that they eat. In *Italy* they boil them with Bacon; and they are certainly to be preferr'd before our Cole or Beans, for they afford a good robust Diet, and are very nourishing, being much commended by *Galen* above all other sorts of Nuts; they also boil them in Wine, and roast them on Embers, and some grind them to Meal and make Bread and Fritters of them, and the *French* Cooks use them in stew'd Meats, Beartil, Pies, &c. The best way to preserve them for use, is to keep them in Earthen Vessels in cool places, but some keep them in a Smoak-loft, others in dry Barley-straw, and others in Sand, &c.

### Chap. X. *Of the Walnut.*

**T**HE *Walnut* is of several sorts, as the large soft Shell, and the small hard Shell; the Wood

Wood likewise differs, some of which is of a whiter, and some of a blacker Grain than the other; the black grained bears the smallest, hardest Nut, and the Timber is much to be preferr'd, the best sort of which are those that grow in *Virginia*, which bear a kind of a square Nut, from whence we might easily procure them. Next unto these are those of *Grenoble*, which are much priz'd by the Cabinet-makers.

The best way of raising *Walnuts* is of the Nut, *How raised.* which you may set like Beans: Gather the Nuts from a young thriving Tree, bearing a full plump Kernel, which is best to be beaten off the Tree (as was prescrib'd of the *Chestnut*) some Days before they fall from the Branches of themselves, and kept in their Husk, or without, 'till Spring; or by bedding of them (being dry) in Sand or good Earth. You may set them about the latter End of *February* or beginning of *March*, or earlier; but if you can, set them with the Husk on, because the bitterness of it is a good preservative against the Worms, and if you chop some Furz and strew about them under Ground, it will be a good Defence for them against the Rats and Mice.

It is a Tree that bears Transplantation but ill, *How transplanted.* and therefore doth much better to stand where it is raised of the Nut; but if you have occasion for the removal of them, let not your Trees be above four Years old when you remove them; and if they be once before removed from your Seminary to your Nursery it may do well; which first Transplantation may be performed at two Years old, and observe as near as you can, to remove them to the same sort of Land that they were raised on, for it is very difficult to make them either grow or prosper on a different Soil, but in the removal of them by no means cut the Head, only shred up the side Branches, because of the hollow Pith which is

apt to let in the Water, and be as sparing of the Roots; any thing of Bruises is very prejudicial to them. You may likewise, as I proposed for the *Chestnut*, put a Tile-sherd under them to occasion the spreading of the Tap-roots, and they may be grafted or budded, which will improve the largeness of their Fruit. The time to remove them is in *November* and *February*, and the best Compost for them is Ashes. They should be planted at forty Foot distance at the least, because they love to spread both their Roots and Branches, tho' they will grow amongst other Wood provided you shred up the side Boughs.

*Soil.*

The *Walnut* delights most in a dry sound rich Mould, especially if they have Chalk or Marle underneath them, and will grow well on any Land that is dry, where they are raised from the Nut, and where they are protected from the Cold (tho' they affect Cold rather than extream Heat) and grow in Pits, Vallies, High-way-sides; also in Lime-stone Ground, if Loomy, and on Hills that are Chalky; and they are so far from prejudicing of Land, that in *France* they plant them in their Corn-fields, esteeming of them a help to their Corn in preserving of it from the Cold; nor are the Roots any hindrance to the Plough, it being a Tree that will root deep enough where they have a Soil that will allow of it.

*Use.*

The *Walnut-Tree* is the most beneficial Tree that can be planted, not only for the Value of the Timber, but the constant Profit they bring by their Fruit; and if the Timber were more plentiful, we should have far better Utensils of all sorts for our Houses, as Chairs, Stools, Bed-steeds, Tables, Wainscot, Cabinets, &c. than what is commonly made of *Beech*, and not so subject to the Worm. They make fine Avenues, and do excellently near Hedge-rows, of which I am sorry Foreign Parts, almost every where, give



give more ample Examples than our own Country, tho' many Gentlemen, of late, are much to be commended for the Improvements they have made this way. Of what universal use this Timber is to the *French* may be seen in every Room both of Rich and Poor. It is of particular esteem with the Joyner for the best coloured and grained Wainscot, with the Gun-smith for Stocks, and excellent for the Bodies and Wheelsof Coaches. In *New England* they make Hoops and Bows with it, and the Drum-maker uses it for Rims, the Cabinet-maker for Inlaying, especially the part about the Roots when it is curled and knotty, which sells often at very great prizes; but to render it the better colour'd, the Joyner puts the Boards into Ovens after the Batch is drawn, or lays them in a warm Stable; and when they work them they polish them over with its own Oil very hot, which makes it look black and slick; but as it is subject to shrink, it ought to be well seasoned before it is worked; it is not good to use for Beams or Joysts, because of the brittleness of it: And besides the uses of the Wood, the Fruit with the Husk, when tender and very young, makes a very good Preserve, and also is used to pickle like Mangoes, and when ripe they are very good Food, afford a very useful Oil for *Painters*, and for Gold Size and Varnish to polish Walking-staves and other Works with, which is wrought in with burning. One Bushel of Nuts will yield about seven Pounds of Oil, which in *France* is much used to burn in Lamps instead of Candles; from whence, in times of Peace; we are supply'd with great Quantities, when it might with much more advantage be made a home Commodity. The young Timber is held to make the better colour'd Work, but the older being more firm and close is the best for Cabinets. That the Husk may open, lay them up in a dry Room, turning of them with a Broom, but without washing,  
for

for fear of Mouldiness, and those that come not out easily of their Husk should be laid to mellow in the Heaps, and the rest in the Sun till the Shells dry, else they will be apt to destroy the Kernel; but the best way to keep them is to bury them in the Ground in a leaden or earthen Pot close cover'd, that the Vermin may not come at them, and they will keep plump all the Year: They are very good for Hogs, but too chargeable a Provision for them with us. The very Husk and Leaves being macerated in warm Water, and the Liquor poured on Walks or Bowling-greens, will kill the Worms without hurting the Grass; and the green Husks boil'd makes a good Colour to dye a dark Yellow without any mixture; and if they, or the first peeping red Buds and Leaves be reduced to Powder, it will serve instead of Pepper to season Meat, or for Sauce, and the Kernel being rubb'd upon the Cracks and Chinks of a leaky Vessel, stops it better than any Pitch, Wax or Clay. After the Nuts are beaten down, the Leaves should be swept into heaps and carry'd away, because their bitterness impairs the Ground, and injures the Trees.

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### Chap. XI. *Of the Mulberry Tree.*

**T**HE *Mulberry Tree* is of two sorts, that which bears the black *Mulberry*, which I mention first, as most known amongst us, and that which bears the white Berry, having a smoother Leaf, and is much to be preferr'd for its usefulness for Silk-worms, in that it buds near a Fortnight sooner than the black, and the Leaves are finer and tenderer for them when young, which are two very great advantages to them, being much planted in the Silk Countries, and would certainly turn to very great advantage if here made use of to the same purpose, it being a  
Tree

Tree that will thrive well in our Climate, and may be had of most of the Gardiners near *London*.

Mr. *Evelyn* says, they raise them in the Countries *How raised.* where they cultivate them for Silk-worms by separating of the Seeds from the Berries, which he says they do, when gather'd thorow ripe, by bruising of them in their Hands, and washing of them in several Waters, and the Seed, which is very small, will sink to the bottom while the Pulp swims on the top; which must be carefully taken off, and the Seeds taken out and laid on Linen-cloth, and dry'd, for which an Hour is sufficient; but the sowing of the ripe *Mulberries* he prefers, which should be a little bruised or squashed, and sowed in rich black Garden Mould, and ought to be well moistened at first sowing, tho' rarely water'd afterwards till they peep; they must be kept warm by being thinly cover'd with Straw to protect them from the Heat and the Birds. The season of sowing them is in *April* or *May*, tho' some forbear till *July* or *August*; and some sow them in *September*, which I think the best time; at the first keep them moderately sheltered and clean weeded, and at two Years growth, about *October* or *February* you may draw them up gently, and dipping of the Roots in Water, transplant them into a warm place in your Nursery, cutting of them within three Inches of the Ground, and giving them three dressings or half-diggings to kill the Weeds in *April*, *June* and *August*. The second Year purge them of superfluous Branches, reserving the principal Stem; of which, if the Frost injure any part, cut it off. This way of raising of them may do well in hot Countries, but I should rather choose to raise them of Layers, from another Plant or Suckers at the Roots of other Trees, which will take very readily: The best time of doing of which is in *February*, leaving not above two Buds out of the Ground, which you must carefully water and they



they will be well rooted in two Years. Dr. Beal says, they may be grafted in the *Black Mulberry* in Spring or inoculated in *July*. The Scions are best to be taken off of an old Tree that bears broad even Leaves, which being the most useful part of the Tree is chiefly to be consider'd.

*How trans-  
planted.*

It is a Tree something difficult to transplant, except it be planted in a rich Soil and while young, and be kept well water'd; do not cut off the Head in removing of them, but trim up the side Branches, so as to leave but a small Head on them. The best time to transplant the *White Mulberry* is in *February*, it being a more tender Tree than the *Black*.

*Soil.*

They delight in a light dry rich Mould, which if it is well manured with Ashes or Horse-dung will be the better, if they are exposed to the Sun and Air, they thrive the better.

The best time to transplant them is at about five Years growth in *September* and *October*, in which Work spare cutting of the Roots as much as you can, and take great care to save them in taking them up; and if you find any of the Branches dry or hurt with the Frost, cut them off, and where the Branches grow too thick, a little thinning of them for the first Year or two after they are transplanted may do well, and likewise digging and stirring of the Earth about their Roots greatly improves them.

Of the two sorts of *Mulberries* the *White* is much the finest, being called so, because the Fruit is of a paler Colour, more luscious and lesser than the *Black*; the Rind likewise is whiter, and the Leaves of a mealy clear green Colour. It is a beautiful Tree for Walks and Avenues, and gives a fine Ornament to the Silk Country, where they plant them, in Walks or regular Groves about their Fields.

*Use.*

The Timber will last as long in Water as the most solid Oak, and the Bark makes good Bast Ropes; it will suffer no Caterpillar or Vermin to breed



breed on it, either as it grows or when cut down, except the Silk-worm only. The chief Value of the Tree is the Leaf for the Silk-worm, for which use they are let for great Sums, single Trees yielding to the Proprietors sometimes twenty Shillings *per Annum*, and to the Owners of the Worms six or seven Pounds of Silk, which commonly sells for as many Pounds in five or six Weeks time; besides which, the Leaves are good for Cows, Sheep and other Cattel, especially young Hogs, being boil'd with a little Bran, and the Fruit is very good for Poultry.

The Leaves best for Silk-worms are those gather'd from Trees of about seven or eight Years growth, for the gathering of them from young Trees is apt to burst the Worms; so doth likewise the Leaves of Trees planted in too waterish a Soil, and those that are sick and yellow. The Leaves should be clipp'd off and let fall upon a Sheet or Blanket and not gather'd by Hand, tho' that is better than to slip them off, which galls the Branches and bruises the Leaves. Gather them as dry as you can, but if you are necessitated to gather them in wet Weather, put the Leaves in a pair of Sheets well dry'd by the Fire, and shake them up and down till the moisture be drank up in the Linen, and then spread them on another dry Cloth. The top Leaves and the oldest should be gather'd last, as being most proper to feed the Worms towards their spinning time.

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## Chap. XII. *Of the Servise-Tree.*

**T**HE *Servise-Tree*, Mr. Evelyn says, is of four kinds, but there is little difference of those which we have in *England*, except only that some of them bear a much larger Berry than the others.

They may be rais'd either by Layers or of the *How rais-*  
Berries, which being ripe, that is, rotten, you may *sed.*  
eat

eat or rub off the Pulp, and sow the Seeds in your Seminary, which is best to be done as soon as you separate them from the Pulp; or if you have a mind to keep them longer, you may keep them in dry Sand till after *Christmas*, and from the Seminary remove them to your Nursery, and from thence transplant them as you have occasion; but because they may often be met with in Woods, it being a Tree that admits well of Transplantation, most furnish themselves with them that way. They may likewise be either grafted or budded upon their own kind to a great Improvement of their Fruit.

*Soil.*

They delight in rich Clay or the Hazel-brick Earth, where it is rather moist than dry, in dry Grounds they never bear well, tho' they will grow almost on any Soil when they are rais'd of the Seeds.

*How transplanted.*

They may be transplanted of any bigness, it being a Tree that bears Transplantation well: if you head them the Wound will quickly heal up.

*Use.*

The Timber is useful for the Joyner, Engraver of Wooden Cuts, Bows, Pullies, Screws, Mills, Spindles, Pistols and Gun-stocks, being of a very fine Grain, and is very lasting, being rubb'd over with Linseed-Oil well boil'd, and may be made to counterfeit *Ebony* and most of the *Indian Woods*; also it is used to build with, yielding Beams of a considerable Substance, and the Shade is beautiful for Walks. They give an early Prefage of the Spring, and peep out in the severest Winters.

### Chap. XIII. *Of the Maple.*

THE *Maple* Mr *Evelyn* reckons of several kinds; he commends most the *German Air* and the *Maple of Virginia*; as for the sorts we have in *England* I can find no great difference in them; those that we keep shred up to run to Standards, have a fine clear Grain, and those that are pollarded grow the

the most knotty and full of Burs, it being a Tree very subject to put out side Branches, which fills it with Knots; but it is prejudicial to let it grow tall where there is any Wood or Trees under it, because of a clammy Dew that sticks to the Leaves, which when wash'd off by the Rain, glues up the Buds of what Trees or Bushes grow underneath, and so kills them; and therefore they are not fit to grow in Hedges or amongst Wood.

It is produced, and doth produce it self by the Seed, Layers, and from the Roots of old Trees, like the Elm, and by Suckers, which occasions their being so plentiful. The Seeds will lie, like the *Ash*, till the next Year after they are sowed before they come up, and therefore they may be order'd the same way.

They may be transplanted almost of any size, and may easily be removed, in that they do not run down with Tap-roots so much as many other Trees do; the best time to remove them is in *October* or *February*.

They affect most a sound dry Mould, especially Banks, in which their Roots delight to run, and desire rather to grow on Hills than Bottoms, tho' they hardly refuse any sort of Soil.

The Timber is very useful for the Turner for Dishes, Cups, Trays, Trenchers, &c. and when it is clean and without Knots it makes excellent Board, and for its lightness is often employ'd by the Musical Instrument-maker under the Name of *Aier*; but that which is fullest of Knots and Burs is of greatest Value, being much priz'd by the Cabinet-maker.

*Use.*

#### Chap. XIV. *Of the Sycamore.*

**T**HE *Sycamore*, Mr. Evelyn says, is our *Acer majus*, one of the kinds of *Maples*, he prefers the

the *German Sycamore* much before ours; it's a quick grower, and where an old Tree is near any dug-up Ground, it will readily furnish you with Plants enough to set in what places you please.

*How raised.*

It is raised of the Keys as soon as ripe, which come up the first Spring, and being provided with a large Leaf, the Weeds will not soon choak them; also young ones may be got of Suckers from the Roots and by Layers; they are managed like other Nursery Trees, and may, when they are big enough, be planted out for Walks or other occasions.

*How transplanted.*

They may be transplanted of any size, which they bear very well; and you may in transplanting of them, either head them, or only trim up the side Boughs, which way is to be preferr'd where they do not grow too small and tall.

*Soil.*

They delight most in a dry light Soil, in which they will thrive very much, tho' they will grow almost on any sort of Land, and may be planted where other sorts of better Trees will not prosper so well, but they are not esteemed so good for Walks or near fine Gardens, because of the falling Leaf which is apt to foul them; and it is a Tree whose Leaves hang upon them the shortest time of any Tree, which makes them neither good nor ornamental for Walks; besides which, there is a Honey-dew which hangs upon their Leaves, and breeds Insects; but both their Dew and Flowers are very advantageous for Bees; Mr. Cook commends them much for Parks and Underwood, because the Deer are not apt to spoil them, and in that they make large Shoots from old Stubs.

*Use.*

This Wood is of excellent Use for the Turner for Trenchers, Dishes, &c. and also for Cart and Plough Timber, being light and tough, and not much inferiour to Ash it self.



Chap. XV. Of the Horn Beam.

**T**HE *Horn Beam* is but of one kind, and is much more valued in Foreign Parts than amongst us, for its shade and the delicate verdure of its Leaves, being the finest and the pleasantest green of any whatever, and a Tree whose Leaves hang the longest upon it, it being one of the forwardest in budding, and one of the last that falls, the old Leaves seldom dropping till the young ones shove them off.

They may be raised of Seeds, which are ripe in *How rais'd.* *August*, and should be sown in *October*. They will lie in the Ground till the next Spring come twelve Months after, and when they peep, should be carefully shaded and weeded: But the best way of raising them is by Layers from another Plant, or by Sets which may be easily procured in Woods, and other places where they grow, they being apt to run up with Suckers from the Roots.

They delight most to grow on cold Hills, in stiff *Soil.* Clays, and in barren moist places in the Woods, there being few Soils that they refuse, except it be those that are very dry and burning; it being a Tree that grows best in the shade and under the dropping of other Trees.

The common way of transplanting of them is like Quick, when they are about the bigness of your Finger, and to cut them off about two or three Inches above the Ground; but they may be planted, when they are about ten or twelve Years growth, for Standards like other Trees.

The Timber is useful for Mill-coggs, and other *Use.* things of that kind (for which purpose it excells all others,) and for Yoak Timber, Heads of Beetles, Handles for Tools, Stocks, Lasts, and for the Turners use. It's very tough and white, and is  
A a good

good Firewood, for which use it is often cut. When the Boughs are too large, they commonly decay its Body, occasioning in it often rottenness and hollowness. It is the quickest grower of any of the hard Woods, and preserves it self the best from the nipping of Deer; and upon that account is more common in Forests and Parks than other sort of Wood, where the Soil is natural for it. It bears clipping the best of any Wood, and makes the thickest Hedges and covered Walks. It grows thickest and fullest of Boughs at the bottom, even to resemble the thickness of Walls it self; upon which account most of the fine Grottos in *Italy*, and the Walks and shady places of *Versailles*, are of this sort of Wood, which they keep about fifteen or twenty Foot high, cutting them with a Scythe fastned to a streight Handle, which dispatches that Work much sooner and easier than the Shears.

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### Chap. XVI. Of the Lime Tree.

THE *Lime-tree* or Linden, Mr. *Evelyn* reckons to be of two sorts, viz. The broad leaved Lime which comes from *Flanders*, being a very quick growing Tree, and bears a very fine broad Leaf, only it is apt to shed too soon; and the wild kind, which, he says, grows naturally in many places of *England*, bearing a smaller Leaf than the other; by which, I suppose, he means the Tree which they call the Pry-tree, which grows the most plentifully in *Essex* of any part of *England* that I have seen; the Timber of which may be as good, if not better, than that of the right Lime, and the Bark is much used there to make Baste-ropes; but for the propagating of it for Walks and such uses, I can no way commend it; first because of its being of much slower growth than the *Flanders* Lime; and

and secondly, because it's a Wood of that ill savour, that if you break a piece of it, you cannot well hold it to your Nose: it yields an ugly stench in burning, which I mention, because it is a good way of distinguishing the true Lime from it, that hath none of that scent.

They may both be raised by Seed, which doth not *How raised.* every Year ripen with us; but when they are ripe, you may know it by their being plump and full under the Husk, and the Body white when bit or cut in two; whereas if the Year be not kind for them, the Husk will be full of nothing but a chaffy substance, or have some small lank Seeds in them. The Seeds are ripe in *October*, which gather in a dry day, and after you have laid them to dry about a Week in an open Room, put them into a bed of Sand indifferent moist, and so keep them till about the middle of *February*, sowing of them under some Wall or other shelter, that may preserve them from the North and North-west Winds; and if the Spring and Summer be dry, keep them indifferent moist, and stick some Boughs over them to shade them, keeping of them clean from Weeds, where let them stand two Summers, and then transplant them into your Nursery, ordering of them as is directed for other Trees.

But the common way of raising of them is by Layers from a Mother-plant, or by laying of such Suckers as come from the Roots. It being a Tree very apt to put forth Suckers, it's best to lay them betimes, as about *September* or *October*, and the next Year they will be fit to transplant into your Nursery; it being a Tree that strikes Root well, and is very easily raised by the same methods that you are directed for ordering the Elm.

They will grow almost in any Soil, but they delight most in a fresh, rich, dry Mould, and will grow well on a loamy Ground, that is rather strong than

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light:

light : But the first Year of planting, if the Spring is any thing dry, they should be kept well watered. It is a Tree will grow any where in Cities and Towns amongst the Smoak of Houses, which choaks other Trees, and therefore is a very proper Tree to plant, as the *Dutch* do for Walks in the middle of their Streets, and round the tops of their Walls; so that some of the Cities at a distance, seem rather Walks of Trees, than to be composed of Houses.

*How trans-  
planted.*

You may, if you have occasion, transplant them very large, as about the bigness of your Leg, but when they are about two Inches Diameter and eight or ten Foot high is the best size; but if it never was transplanted before, it is better to remove it while smaller. It bears removing well, especially if once or twice removed in the Nursery before you plant it out into Walks or Hedge-rows.

It is a Tree that loves pruning, and heals the wound the soonest of any, it naturally delighting to grow tall; and therefore if in your Nursery it shoots much, leave some side-Boughs to check the Sap, lest by forcing it too much up into the head, it make the head too large for the body to bear it, which many times in high Winds is apt to break off the top; and therefore when ever you plant them for Walks or in Hedge-rows, a discreet thinning of the Boughs is necessary to let the Wind through; for being a large Leaf and a light Wood, the Wind is very apt to damage them. If you plant them for Walks, set them at about twenty or thirty Foot distance.

*Use.*

It is a noble Tree for Walks and Avenues, casting a large shade, and growing of a fine shape for that use, and is of a pleasant green Colour. The Timber is fit for any use that the Willow is good for, and is much to be preferr'd both for its strength and lightness, being of a fine white Colour, and works easily without being subject to split,



split, and is much used by Carvers for the Images they adorn Ships with; for which, if it is large, it sells for as good a price as most other sorts of Timber. It is also employ'd by Architects for Models for designed Building, and for small Statues and Figures, and the Coal is esteemed for Gun-powder better than that of Alder it self.

Chap. XVII. *Of the Quick Beam.*

**T**HE *Quick Beam* or wild Sorb, by some called the *Irish Ash*, is a species of wild Ash, having both a Bark and Leaf much resembling the Ash, only the Leaf is jagged on the edges, and something smaller and longer in proportion to its bigness; and instead of Keys bears red Berries, which are very ornamental to them, and are preceded by Blossoms of an agreeable scent.

They are best raised of the Berry, which is ripe How rais'd. in *October*, when it is the best time to sow them. They must be covered but shallow, an Inch deep being deep enough to lay them. Whether they come up the first Year, or lie in the Ground like the Ash till the next Spring after, I cannot yet learn.

They delight to grow on Hills, and in Woods, Soil. and in any dry Ground, and grow more commonly in the Northern than Southern parts of *England*, as upon the coldest, bleak and most exposed of the Peak Hills in *Derbyshire*, where they thrive without shelter upon dry stony Land, which makes me think them a very hardy Tree, and worth propagating.

I suppose in Transplanting of them, they may How transf. plant'd. be ordered as the Ash. Whether they will grow to the same stature, I cannot determine, because I never saw any of them but on the barren Peak Hills. Mr. *Evelyn* says, they plant them every where in the Church-yards in *Wales*.

Use.

It is a very tough Wood, and all heart, being good for the Wheel-wright, and all sorts of Husbandmen's Tools. If large, 'twill make good Plank-boards and Timber. Mr. Evelyn says, it is commended by our Fletchers for Bows, next unto Yew ; that the Berries fermented by themselves, if well preserved, make an excellent Drink against the Spleen and Scurvy ; and that Ale or Beer brewed with them, makes an incomparable Drink, which he says is much used in *Wales*.

### Chap. XVIII. Of the Birch.

**T**HE *Birch* is a very common Tree, and needs no description, being to be found almost in all parts of *England*.

How rais'd.

It increaseth commonly from the Roots and Suckers, tho' it bears Seeds which it sheds in the Spring ; but whether the Seeds will produce them, I have not yet heard of any that have made the trial.

Soil.

It affects most a dry barren Soil, where hardly any thing else will grow, and will thrive on any sort of Land, let it be wet, dry, sandy, gravelly, rocky or boggy, and the barren heathy Lands that will hardly bear any Grass.

How trans-  
planted.

The best way of transplanting of them, is to remove the Suckers that have Roots to them, which cut off about three or four Inches long, and plant as you do Quick, from which will come many Shoots, which you may let grow for underwood, or reduce them to one Stem, which in a few Years will make it fit for the Turner.

Use.

Birch, tho' it is the worst of Timber, yet it is of use for many occasions, as for Ox-yoaks, Hoops, Screws, Wythes for Faggots, Brooms, &c. and for Dishes, Bowls, Ladles, and other Utensils ; especially

especially the Roots, of which, in *Russia*, they make very fine Bowls and Dishes that are very tough, and not subject to split, covering their Houses with the Bark, of which the *Indians* in the Northern Parts of *America*, as *F. Hennepe* says, make Canoes that are very swift and large; and of several other parts of the Tree, they make fine Baskets, Boxes, &c. It is good Fuel, and makes very good Charcoal, besides the Wine made of the Sap, which I shall refer to another place.

Chap. XIX. *Of the Hazel.*

THE *Hazel* is of several kinds, and differs both as to the Leaf and Nut, even amongst the wild kind, without reckoning the several sorts of Filberts, and the large *Spanish* Nut, the Fruit of which last is much improved by Transplantation and Grafting.

The Hazel is best raised of Nuts, which you may sow like Mast in a pretty deep Furrow; the best time for the doing of which is in *February*, because Vermin are very great devourers of them. They are very much prejudiced by Frost, till which is over they should be kept moist in their own Leaves or in Sand, and not suffered to mould. They may likewise be raised by Layers and Suckers from their own Roots, which they are apt to put forth in great plenty.

They will grow on any cold, dry, barren Soil, that is either sandy, gravelly or chalky, and also on Mountains and Rocks, but they thrive best on moist Bottoms, sides of Hills and Banks; and the Filbert loves a rich black Mould.

They are commonly transplanted small, being seldom removed, but to fill up or thicken Woods

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with,

with, or for Hedges, being cut like Quick-set, about six or seven Inches long.

Use.

The use of the Hazel is for Hoops, Poles, Spars, Rake handles, Angle-rods, Fuel-bands, Hurdles; and Mr. *Evelyn* says, that the Chips of it are the best Wood of any to fine Wine with.

## Chap. XX. Of the Poplar, Aspen and Abell.

THESE three sorts of Trees are much of a kind; only the *Poplar* is esteemed of three sorts; the white Poplar which is the most common amongst us; and the water Poplar, the Leaf of which is of a pale green Colour, shaped something like the other, but is not so white underneath; and the black Poplar.

The *Aspen* or Asp-tree hath Leaves much the same with the Poplar, only much smaller and not so white.

The *Abell* is a kind of white Poplar, only much finer, bears a larger Leaf, and makes a much stronger Shoot, being a much quicker grower; the best sort of which comes from *Holland* and *Flanders*.

How rais'd.

They may be rais'd by Layers or Suckers taken from the Roots, which they are very apt to put forth; especially if any way lopped or cut down, often to the prejudice of the Land they grow in, especially if it is any thing good; so that a small place inclos'd where they grow, will furnish you with Sets enough, tho' I think those rais'd by Layers from a Mother-plant make the best Trees.

Soil.

They will grow on any sort of Land, wet or dry, but thrive best on a rich moist Soil, especially the water Poplar. It is esteemed one of the quickest growing Trees that is; especially the *Abell*, which is one of the best Trees to plant where



where you desire a speedy Shelter and Walks, they many times making Shoots of eighteen or twenty Foot long in a Year, and any sort of Trees or Shrubs will thrive under their shade.

It is a Tree that bears Transplantation well, <sup>Transplantation.</sup> and may be planted out small like Quick, cutting of them two or three Inches above the Ground, which you must keep clean weeded, and you may prune up the most thriving Shoots for two or three Years. It will make a fair Standard; or you may transplant them when pretty-large, cutting off their heads, which they will quickly recover, and set them at ten or twenty Foot distance, but it is a Tree that doth not grow to any very great age.

The Timber is very good for all sorts of <sup>use.</sup> white wooden Vessels, as Trays, Bowls, and other Turners Ware, Bellows-makers, Ship-pumps, Wooden-heels, Lafts, Carts, Hop-poles, &c. and makes good Timber for Building where it lies dry, and very good Boards, and is serviceable for Fuel; great quantities of it being raised in places where Wood is scarce; for the lopping the Boughs of which the best time is *January*.

## Chap. XXI. *Of the Alder.*

**T**HE *Alder* is reckoned chiefly to be of two kinds; the common sort which only affects moist Ground, and the blacker sort which thrives better on drier Lands.

The Alder is propagated by Truncheons, and, <sup>How rais'd.</sup> some say, may be raised by Seeds; but large Roots or small Suckers, which they put forth very plentifully, are the best to raise them of.

They delight most in the moistest boggy places, <sup>soil.</sup> where nothing else will grow, and are a great Improvement

Improvement of such Lands, and will grow on the sides of Rivers and Springs.

*How trans-  
planted.*

The best way of removing them, is to transplant the Suckers, which trim up to one Branch; and after they have struck Root, you may cut them within three or four Inches of the Ground, which will cause them to spring in clumps and to increase their Roots and Suckers, or you may transplant the Roots which will spring into Branches; and if you raise them of Truncheons, steep one end of them in water some time before you plant them, making of holes for them, and not forcing them into the Ground to strip up their Bark; the best time of doing which is in *February*: and as they are to be planted in moist places or near Springs, it will be good to plant them deep, that the Streams may not wash away the Roots, and to preserve them steady from the violence of the Winds. If you have occasion to cut or prune them, let it be done in *February*, which is the best time for all Aquaticks or soft Woods, because they will be the less time exposed to the wet of the Winter.

*Use.*

It is excellent Timber for Water-works where it may constantly lie covered. It will grow as hard as a Stone. The Coal is good for Gun-powder, and the Wood for Piles, Pumps, Hop-poles, Water-pipes, Troughs of Sluces, Wheels, &c. and is in much request with the Turner. The Bark is much sought after by the Dyer, and some Tanners, and mixed with the Fruit, or macerated in Water with a little rusty Iron, it makes a black Dye, and may be used for Ink. Faggots made of it, thrown upon Flints, Brick-bats and other Rubbish that is laid in Drains, and Earth thrown on them, will last a great many Ages.

Chap. XXII. *Of the Withy, Sallow, Ozier  
and Willow.*

**E**ACH of which kinds (there being several sorts) I shall not particularize, because they may be all propagated the same way, and delight in the same Soil, especially the Withy, Sallow and Willow.

They may be raised of Cuttings stuck in the *How rais'd.* Ground, or large Truncheons of eight or ten Foot long, where they are in danger of Cattel coming at them, because they will by their height be the better secured from them, by putting of Bushes or other Fences about them; only you must observe when they put their Buds out first, to rub off all the Under-buds, leaving only a few near the top to draw up the Sap.

They may likewise be raised of Layers, by which means, you may thicken your Woods, and have Plants to set out, which if rooted, are much better to plant on dry Ground than Sets. They may be raised of Seeds; but as they seldom come to be ripe in *England*, and the other ways of raising them being easie, it will be but a needless Experiment to endeavour the propagating of them that way.

All the several sorts delight in a moist Soil, as *Soil.* I said before; but the Withy and Sallow will grow on the driest Land, and the Willow in Banks near Rivers and moist Ditches, where they can reach the moisture with any of their Roots; but the Ozier will grow the best on the moistest Lands, especially such as are overflowed with the high Tides and left dry at the Ebb.

The best time to transplant them and to lop them, is in *February*, just before the Sap begins to rise, especially if you design the raising of them by Cuttings or Truncheons, those Cuttings being

ing esteemed the best which grow nearest the Roots. In many places where Wood is scarce, they make great advantage of them by planting them in the Quincunx Order at ten Foot distance; tho' I think fifteen or twenty Foot a better distance; but a fat rich Soil requires their being planted at greater distances than a more barren Soil doth.

*Use*

It is a good Wood for fire, if kept dry, and is very useful for Stakes in Hedges, to prevent Hedge-breakers pulling of them up, and likewise to thicken your Hedges; it is also good for Rake and Scythe-handles, Heels, Clogs, Pattens, Hurdles, Sieves, Lattices, and for several Uses of the Turner, &c. and the Oziers for Baskets, Panniers, and several other Utensils, which makes the Ozier Ground of very great value, even beyond that of Wheat; many Ozier Grounds being Let for ten Pounds *per* Acre, which considering their constant Crop, the small charge that attends them, and the little pains that is taken to renew any of the old Plants when they decay, which is done by only cutting off a piece of Ozier and sticking of it in the Ground, makes it one of the greatest Improvements that is of moist Lands.

### Chap. XXIII. *Of the Fir, Pine, &c.*

**F**IRS are of several sorts, as the *Norway*, *Spruce*, *Dram*, *Scotch*; but the best sort both for Beauty and Timber, is that which they call the Silver-Fir, because the under-side of the Leaf is of a white Colour, and the Leaf is longer than any of the former; except the *Scotch* Fir, which, whether that may not rather be esteemed a Pine than a Fir is disputable. The Silver Fir being, I suppose, the same as Mr. *Evelyn* calls the *Spanish* Fir; it grows



to the greatest height of any of the sorts of Firs which we have in *England*, and is of great value for Masts of Ships.

The common way of raising the several sorts *How rais'd.* of Firs, is of Seeds; the best way to get which out of the Cone or Clogs, is to lay them in the Sun, which will quickly occasion them to open; or in Water a little warm, which you must take care to gather before they open, which they commonly do in *June*, when the weather begins to be hot, it being the second Year before they are ripe; they may likewise be raised by Slips or Layers interred about the latter end of *August*, and kept moist. The Silver-Fir, the Gardiners tell you, is to be raised no other way than by Seed, th'o I am of another Opinion in that I could never produce them that way, and I am rather inclined to think them produced of Layers; but this is a Secret I could never yet discover. As to the Seeds, do not take them out of the Cone or Clog till you use them, in which they will keep good two or three Years. The best time to sow them is in *March*; they should be very carefully kept from the Mice before they get up, who are very desirous of them; and when they begin to peep, shelter them with Furz, or such sort of Fence, from the Birds, who are very apt to pull them up by taking hold of the Cap, which they commonly bear upon their tops when they first spring. The Beds wherein you sow them, had need be sheltered from Southern Aspects. Sow them in shallow Rills, not above half an Inch deep, and cover them with light Mould. They will peep in about five or six Weeks time, and being risen two Inches high, establish their weak Stalks by sifting of some more Earth about them; for being heavy they are apt to swag so as often to blow out of the Ground. When they are of two or three  
Years

Years growth, you may transplant them where you please; and when they have gotten good Root they will make very large Shoots, but not for the first three or four Years.

Soil.

They will grow on any dry Soil, especially the light hazelly Brick-earth, and refuse not moist barren Gravel, or any sort of poor or rocky Grounds or Clays, except they are too moist and spue.

How rais'd.

The best time to transplant them, is from the middle to the latter end of *August* and *March*. Remove them with as much Earth about the Roots as you can, tho' the Fir will bear a naked Transplantation better than the Pine. You may transplant them from the place where they are raised of Seeds; but if you design to plant them where the Cattle come, you must first remove them into a Nursery, where you may let them stand till they are eight or ten Foot high, and then plant them out, observing to water them well, and neither to bruise nor cut the tops; and when you prune them, leave the Stories about a Yard asunder; the best time of doing of which, is in the beginning of *March*, and be careful to rub a little dry Earth upon the wound where you cut them, to stop the Turpentine, and to prevent their spending of themselves too much, which these Trees are very subject to do; and it will cause them to grow taper, to shoot in height, and to let the Wind thro' them, which may prevent their being blown down, and the breaking of their Boughs, which these Trees are very liable to during the Winter Gusts; and therefore, where you plant any of them, I should advise the planting of other Trees round them to shelter them, but be sure, on whate'er Soil you plant them, to let no Dung touch either their Body or Root; and if you plant them on Gravel-ground, Mud or Clay mixed with it will do well to temper

temper it, and if you mix Sand with Clay where the Soil is Clay, it will be better than Dung; but the sheltring of them with some Litter will do well to preserve them from the parching heat in Summer, and the cold in Winter.

There are several sorts of Pines, but amongst us not above three or four sorts; but as they are to be raised of Seeds, and ordered the same way, and delight in the same sort of Soil as the Fir, I shall refer you to the Directions of the Fir-tree for the ordering of them.

They do not bear Transplantation so well as the Fir when large, and should be always remo-<sup>How transf-</sup> planted ved with as much Earth as you can, and both Firs and Pines should be well watered at first removal, and planted as shallow as their Roots will allow of.

There is likewise the *Piceaster* (a wilder sort of Pine,) out of which the Pitch is boiled, which grows both in the cold and hot Countries; the Body of which being cut or burnt down, Mr. Evelyn says, will emit Suckers from the Roots, which neither the Fir nor Pine will do.

I need not say any thing of the Use of these Trees <sup>use</sup> for Building, Masts, &c. it being so well known to most that have any occasion.

#### Chap. XXIV. Of the Larch, Platanus, Lotus and Cornel Trees.

THE *Larch* Tree, Mr. Evelyn says, may be raised of Seed, and that it will grow in *England*, which he commends much for the largeness, durableness and usefulness of its Timber, and gives you an account of several Buildings in *Italy* made with it, which he says no Worm will touch nor hardly any fire burn.

The

The *Platanus* is a very beautiful Tree, and grows very well in *England*. It may be had at most of the Gardiners near *London*. It's raised by Seeds or Layers. It affects a moist Soil, and should be well watered when transplanted. It is a fine Tree for Walks, and 'tis pity it's not more propagated.

The *Lotus* is a Tree frequent in *Italy*, that affords a fine shade, and very durable Timber. It affects a moist Soil, and the Roots of it are very fine for Hafts of Knives and other Tools; and of the Wood are made Pipes and Wind Instruments.

The *Cornel* is a very durable Wood; and, as Mr. *Evelyn* says, is useful for Wheel-work, Pins, Wedges, &c. and will grow to a good stature with us. Its Berries are commonly very much used for Preserving and Pickling.

### Chap. XXV. Of the *Cypress-Tree*.

THE *Cypress* is of two sorts; the Sative or Garden-tree, which grows in the best form, and is the most beautiful; or that which is called the Male, which bears Cones, and is of a more irregular shape. This Tree is commonly much prejudiced by the staking and binding it up to a pyramidical Form, which heats the inward Branches for want of Air, and occasions their moulding, hindring of their growth, and is very troublesome and chargeable; whereas with clipping only, they may be brought to a much finer shape, and not be so lyable to prejudice from their bandage, nor from the Frost. They also make fine Hedges when kept clipt, branching from the very Roots; the best time of doing which is in *April* and *August*. If they run too much without branching from the bottom, a discreet cutting of the principal



incipal Stem may be of advantage to make them shew beautiful, but a good management of them while young may prevent that occasion.

They are raised of the Seed. Procure them in How raised: the Nuts, and when you have occasion to use them, expose them to the Sun, or put them in warm Water, and the Seeds may be easily shaken out. The time to sow them is in *April*, which do after this manner: Prepare a Bed of fine Earth, and make it even, upon which strew the Seeds pretty thick, and sift more Mould upon them about half an Inch thick, keeping of them well watered every Evening, except when the Season waters them, and after a Years growth you may transplant them: when they are come up well, be sparing of your watering of them.

They will grow on any dry Ground, even Soil. Gravel and Sand, especially the Male sort, and will never be injured by frost if they are not planted in a cold moist Soil.

The Timber is very lasting, and never cleaves use. but with great violence. The bitterness of its Juice preserves it from Worms and Putrefaction. It is the best of all Timber for Building, and will last when either wet or dry.

## Chap. XXVI. *Of the Cedar.*

**I**T is a great pity the *Cedar* is not more propagated among us, being so easily raised, and a Tree that will grow so well with us. They are of several sorts and kinds, some of which do very much resemble the *Juniper*, which I cannot but think a Species of it, and therefore it might do well to be better encouraged where the Soil is proper for it, to see what magnitude it will grow to. Other sorts of it are more like *Cypress*,

as, (according to the *London-Gardeners Opinion*,) those kinds growing in *New-England* and *Virginia* are: But the Cedar of *Lebanon* bears the severest Weather we have. I have raised several of them of Cones I had from thence, and have now a Walk planted with them; and wheresoever they are to be had of any sort, the Seeds may be brought from the furthest part of the World in the Cones, for I had some two Years old that grew as well as those that were brought me directly from *Mount Lebanon*; and I am apt to believe, if they are kept in the Cones, and not taken out till just you sow them, they may be kept three or four Years without prejudice.

*How rais'd.*

They are raised of Seeds which seldom fail of growing if ordered right, and if care be taken to preserve them from the Mice, who are very greedy of them.

They bear a Cone as the Pines do, but it is rounder and more like Scales; the same Observations are to be minded in the gathering of them, as that of the Pine; only to open them, let them be steeped in cold water forty eight Hours, and the Seeds set as soon as taken out. The time of the setting of them is about the latter end of *March*, which sow on a Bed of good rich Mould, and lay it at least two Foot deep, but let no Dung come near them; and if your Bed be made a little sloaping, it will do well, that the water may run off from them, for too much wet is apt to burst the Seed. They cannot well stand too dry, if they are but shaded in dry Weather. As they come up, sift Earth about them to establish their Roots, as is before directed about the Pine.

*Soil.*

They delight most in a rich dry Soil, but they grow very well with me in *Essex*, both on the hazely Brick-earths and on Gravel, that hath some-

Something of good Mould about a Foot deep on the Surface of it.

The best time of transplanting of them is at <sup>How trans-</sup> three or four Years old from the place where you <sup>planted.</sup> raised them of the Seed. If the first Year you water them with a List, it may do well, and be of great advantage to them. Whether they may be removed at a larger growth, I have not experienced, and so can say nothing of it. They grow but slowly the first seven or eight Years; but I am told that after that, they grow with as much speed as most other sorts of Trees do.

I need not say much of the Usefulness of the <sup>Seal</sup> Timber, being so much known. The fragrancy of which, its fine Grain for all sorts of Work, and its durableness being able to recommend it for all Uses, besides the stateliness of it for Walks and Avenues, several of them being reported to be two hundred Foot or more in height. A Friend of mine assured me that he cut down one in *Barbadoes*, that had above four hundred Foot of Timber in it; but I am told there are some of a far greater magnitude.

## Chap. XXVII. *Of the Cork, Ilex, &c.*

**T**HE *Cork-Tree*, with us, is of two sorts (and there are divers other Species in the *Indies*) one of which is of a narrower less jagged Leaf than the other, being a constant green, whereas the other is broader and falls in the Winter, it grows near the *Pyrenean Hills*, and in several parts of *Italy* and the North of *New England*, especially the latter sort, which is the hardiest and best for our Climate; and that upon the worst of Soils, as dry Heaths, stony and rocky Mountains, where there is hardly Earth enough

to cover the Roots. They may be had of the Gardiners at *London*, but with what success I cannot tell.

This Tree hath three Barks, on the outer of which is the Cork, which they strip once in two or three Years in a dry Season, because the wet is apt to prejudice the Tree; and one of the other Coats being red, when they fell the Tree, bears a good price with the Tanner. The Wood is good for Fire, and useful for building Pallisadoe Work, &c.

*Ilex.*

The *Ilex*, or great scarlet Oak, thrives well in *England*. They are a hardy sort of Tree, and easily raised of the Acorn. If we could have them brought to us well put up in Earth or Sand, they might be brought any where from Foreign Parts. The *Spaniards*, Mr. *Evelyn* says, have a sort they call *Enzina*, which bears Acorns, of which they have profitable Woods and Plantations: the Wood of which, when old, is finely chambletted as if it were painted; which Wood is useful for Stocks of Tools, Mallet-heads, Chairs, Axle-trees, Wedges, Beetles, Pins and Pallisadoes for Fortifications, being very hard and durable. Of the Berries of the first sort is extracted the Painters Lac, and the Confection of Alkermes. Their Acorns are good Food, little inferiour to Chesnuts: But the *Kenne* Tree doth not always produce the *Cocum*, except it grow near the Sea, and where it is very hot, and therefore they frequently cut down the old Trees that they may put forth fresh Branches, upon which they find them.

*Tbuya*, or *Arbor vite*, grows of Layers or Slips to a tall streight goodly Tree, hardy in all Seasons. The Wood makes incomparable Boxes, Bowls, Cups, and other Curiosities; and the Leaf makes one of the best Ointments for green Wounds that is, closing of them suddenly.

*Box*



*Box* deserves our care because of the excellency <sup>*Box.*</sup> of its Wood, and in that it will prosper on the declivity of cold dry barren Chalky-hills, where nothing else will grow; of which there are two sorts, the dwarf *Box*, and a taller sort that grows to a considerable height. It will increase of Slips set in *March* or about *Bartholomew-tide*, and may be raised of Layers or Suckers.

It is of use for the Turner, Ingraver, Carver, Mathematical Instrument-maker, Comb-maker, &c. for which they give great Prizes by Weight as well as Measure, especially the Roots (as even of our neglected Thorn) which is of great value for Inlaying and Cups.

*Yew*: Since the use of Bows is laid aside, the <sup>*Yew.*</sup> Propagation of this Tree hath been neglected, tho' it will grow on our coldest and barrenest Hills, especially if chalky, where it may be of use to propagate it for the same uses as *Box*, for most of which purposes it is as good, besides which it makes extraordinary Axle-trees.

It is easily produced of the Seeds, which must be washed and cleansed of their Mucilage, and then buried in Sand made a little moist any time in *December*, and so kept in some Vessel in the House all Winter; and in some shady cool place abroad in Summer. The Spring come twelve Months after you have put them in Sand, sow them on a Bed, the Ground not too stiff. Some bury them in the Ground like Haws. It is commonly the second Winter before they peep, and then they rise with their Caps on their Heads. At three Years old transplant them. They may likewise be raised by Layers or Slips, and so planted out for Standards, Walks and Hedges, being to be clipped in what form and order you please, and therefore are much valued by our Modern Planters, to adorn their Walks and Grass-plats.

B b 3

*Juniper*

*Juniper* is of three sorts, whereof one is much taller than the other, the Wood whereof is yellow, and if cut in *March* is sweet like Cedar ; but this is accounted a spurious kind. They should neither be shaded much nor dropt upon. They may be raised of Seeds, which will peep in two Months after sowing. They should neither be watered nor dunged; and being managed like *Cypress* will make fine standards; especially where they are not obnoxious to eddy cold easterly Winds, which are apt to discolour them, but they soon recover it again. To make it grow tall, prune it close to the Stem, and loosening the Earth about the Roots, hastens its growth much. It may be clipt for Hedges.

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Chap. XXVIII. *The Laurel.*

**T**HE *Laurel* or Cherry-bay is most commonly used only for Hedges, but being planted upright and kept for Standards by cutting away the side Branches, so as to maintain only the principal Stem, it will rise to a large Tree, and carries a fine spreading head, that is very ornamental and shady for Walks or Groves, and may this way be of much better use than to plant them in Hedges, as most do, where the lower Branches growing sticky and dry, by reason of their frequent and unseasonable cuttings (the genius of this Tree being to spend much in Wood) causes them never to succeed after the first six or seven Years, but are to be new planted again or abated to the Roots for a fresh Shoot.

They are raised of the Seeds or Berries with extraordinary facility, or propagated by Layers, Slips and Cuttings set about the latter end of *August*, or earlier at *St. James-side* in a shady moist place, they delighting most in a moist cool Soil.

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BOOK XII.

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## Chap. I. Of Coppices.

**A**S for *Coppices* or Under-wood, I have already shewed how each particular sort of Tree is to be raised both by sowing and planting, and for the raising of Coppices, great care ought to be taken that the Wood they are to be composed of, be such as is proper for the Soil you raise them on, and that the sort of Wood is proper for such uses as you design to sell your Wood for, which you must be regulated in by the vent you have, as whether it is for Fire-wood, for which the Oak, Horn-Beam, and other hard Wood is best; or for Hoops, Hop-poles, &c. for which the Ash, Chesnut, Oak, Hazel, &c. is the most useful, as I have already shewed; and according to the profit of your under-wood, regulate the thickness of your Standards, which as they are thicker or thinner, do more or less injury to your Under-wood. You are likewise to consider at what growth you can sell your Under-wood, only remember that the older and taller your Under-wood is, the better it is for Fire-wood, and the better it is for what Standards you leave, because they will be the taller and streighter by being forced up by the Wood that grows about them; tho' a deep Soil, as I observed before, contributes much to their spiring, and according to the time of your felling, it is necessary to lay out your several Falls, that so you may have an annual Succession to yield a yearly profit, which in many places is from eight Years to twenty or

thirty: but tho' the seldom felling of Wood yields the more and the better Timber, yet the frequent cutting of Under-wood makes it the thicker, and gives room for the Seedlings to come up. If many Timber Trees grow in the *Coppice* which are to be cut down, fell both them and the Under-wood together, cutting off the Stubs as near the Ground as may be, and the Stubs of the Under-wood asloap and smooth, and not above half a Foot from the Ground, and stock up the Roots of the Timber Trees, if they send forth no Shoots, (which they are not apt to do if sawn down, which is the best way of felling of Timber Trees) to make way for Seedlings and young Roots to shoot; but where you design to sow Seeds, you must prepare your Ground with good Tillage, as much as you do for the sowing of Barley; and about *February* sow them, and if the Soil be shallow, plow your Ground into great Ridges, and it will make the Soil lie the thicker on the top of each Ridge, by which means the Roots will have the more depth to search for nourishment, and the Furrows will in a little time be filled up by Leaves, which when rotten, will lead the Roots from one ridge to another; and if you sow them on the sides of Hills that are dry, plow your Ridges cross the descent of the Hills, that the water may be kept on the Land without having too sudden a descent; and if your Ground be very wet, observe just the contrary. Some sow their Seeds with a Crop of Corn; but as the Season for the sowing of Corn is too late for the Seeds, it is better to sow them by themselves, and be sure to keep them well weeded the first and second Year. But if you have a mind to raise Wood on very barren dry Land, sow it with what Fruit or Seeds you design it for, and with them sow Furz or such Trumpery, as will grow on



on the worst Land, and it will become a shelter to your Trees, which when they have once taken Root, will soon outgrow the Furz, and kill it with their dropping. For the raising of *Coppices*, the nearest distance for the Plantations ought to be about five Foot for the Under-wood; but as to what number and scantlings of Timber, you are to leave on each Acre, the Statutes direct, and it is an ordinary *Coppice* which will not afford three or four *Firsts*, that is, Bests, fourteen *Seconds*, twelve *Thirds*, and eight *Wavers*, &c. according to which proportion the sizes of young Trees in *Coppices* are to succeed one another. By the Statute of the 35th of *Henry* the VIII. in *Coppice* or Underwood felled at twenty four Years growth, there were to be left twelve Standlings or Store Oaks upon each Acre; and in defect of so many Oaks, the same number of Elms, Ash, Asp or Beach, and they to be such as are likely Trees for Timber which are to be left, and so to continue without felling, till they are ten Inches square within a Yard of the Ground. In *Coppices* above this growth when felled are to be left twelve great Oaks, or in defect of them, other Timber Trees as above, and so to be left for twenty Years longer, and to be enclosed seven Years.

However, I think it better to leave a much greater number of Timber Trees, especially where Under-wood is cheap, and as to the felling, begin at one side, that the Carts may enter without detriment to what you leave standing; where your Woods are large, it is best to have a Cartway along the middle of them, by which means you may fell on each side where you will, and have a Cart-way always ready without prejudice to the rest of the Wood. The Underwood may be cut from the beginning of *October* to the latter end of *February*, but *February* is the best Month to  
cut

cut Wood in, where you have but a small quantity to fell, that you may do it before the spring comes on too much : take great care to prevent the Carters brushing against the young Standards, and let all your Wood be carried out by Midsummer, and made up by the end of *April* at the latest; for where the rows and brush lie longer unbound or unmade up, you spoil many of the Shoots and Seedlings. If the Winter before you fell, you inclose it well, so as to keep all Cattle out of it, it will recompence your care and trouble.

By the Statute Men were bound to inclose *Coppice*-Wood after felling, if under fourteen Years growth, for four Years; those above fourteen Years growth to be six Years inclosed; and for Woods in common, a fourth part to be shut up, and at felling the like proportion of great Trees to be left, and seven Years inclosed; this was enlarged by the 13th of *Elizabeth*. Your elder Under-wood may be grazed about *July*, or in Winter; but for a general rule, newly weaned Calves are the least prejudicial to new cut Wood where there is an abundance of Grass, and some say Colts of a Year old, but then they must be drove out at *May* at farthest; but if nothing at all be suffered to come in, it is better, every Man's experience being able to direct him.

If your Woods happen to be cropt by Cattle, it is best to cut them up, and they will make fresh Shoots; whereas what is bit by the Cattle will stunt for several Years before it will take to its growth.

If your Woods are too thin, lay down Layers of the longest and smallest Shoots you can find of such kinds of Wood as you like best to have your *Coppice* of, or that is nearest to the bare place where you want a supply, according to the method

thod already proposed for the laying of Layers of Trees, and they will send forth abundance of Suckers, and thicken and furnish a *Coppice* very speedily.

As to the size of Faggots and Wood Stacks, &c. it differs in most Countries, and therefore you must in all those things be guided by the custom of the Country where you live; the prices of which, and the stacking up of Wood, Roots, Stumps of Timber Trees, &c. I shall give you an account of hereafter, when I come to consider the Prices of the Husbandman's Labour and Charges. I shall at present only Note one thing, and that is, that when the Workmen have bound up the Faggots, with their Bills they trim off all the straggling small Branches to make the Faggots more neat and tight, which trimmings they commonly gather up and put into the middle of the next Faggot, where it is of little advantage, but would be of much greater profit to the Land, if it were left to rot in the Wood, for which it is as good as Dung, and would much advance the growth of your Trees, as I have known by experience; for tho' the Leaves falling and rotting in Woods do much improve them, yet it is not to be compared with the advantage that they receive from rotten Wood, which will turn any Soil whatsoever into a rich black Garden Mould, as may be found by experience by any that will make Observation of it where Woodstacks have stood; and tho' those sticks are but small and cannot do much the first time, yet a constant repetition of it every Fall is a much greater improvement of Wood than can easily be believed.

The best time to fell Timber is in *January* or *February*, because the Sap is then all down in the Root; but the Oak they commonly fell about *April* or *May* when the Bark will run, which they  
are



are obliged to do by the Statute, because of the Bark for the Tanner, which is a very great prejudice to the Timber: but the Opinion and Practice of Men have been very different concerning the best time to fell Timber. *Vitruvius* is for an Autumnal Fall; *Cato* was of Opinion, that Trees should not be felled till their Fruit was ripe, and tho' Timber unbarked be obnoxious to the Worm, yet we find the wild Oak and many other sorts of Trees felled late (when the Sap begins to be proud) to be very subject to the Worm too; whereas being cut about Mid-winter, it neither casts rifts nor winds, because the cold of the Winter both dries and consolidates it.

Some Authors advise in felling of Timber to cut it but into the Pith, and so let it stand till it be dry, because, say they, by drops there will pass away that moisture which would cause putrefaction; others advise, to bore a hole in it with an Auger for the same purpose, but I suppose a nipping Frost will effect the same, by causing the moisture to descend into the Root, not that I would have them felled in frosty Weather, but not felled till a hard Frost hath been upon them.

When the Stubs of your Under-wood are great, stock them up, this is a good piece of Husbandry, because it makes way for Seedlings and young Roots that are thriving, whereas when the Stumps are old and large, they are apt to let in the water and be unthrifty; the time of doing which is in the Winter season.

When you fell your Woods, leave young Trees enough, you may take down the worst at the next Fall, especially if any grow near a great Tree, that you think may be fit to fell the next Season, to supply its place, because several may be spoiled by its fall.

When



When Trees are at their full growth, there are several signs of their decay, as the withering or dying of any of the top Branches; or if they take any water in at any Knot; or are any ways hollow or discoloured; if they make but small Shoots; if Wood-peckers make any holes in them; also a very spreading Tree in a Wood, is many times very prejudicial, because of the young Trees it drops upon, according to the Directions of the Poet,

*To fell those Trees can be no loss at all,  
Whose Age and Sicknes would your Ax forestall;  
A youthful Successor with much better grace,  
And plenty will supply the vacant place.*

Lastly, Note that if you sell your Wood by the Acre, you must take great care beforehand to mark out what Standards shall be left, or else the Wood-Buyers will be very apt to deceive you; and observe that all Wood-Lands are measured by the eighteen Foot Pole.

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## Chap. II. *Of Transplanting of Trees.*

**T**HE smallest Trees, and those that have been transplanted in Nurseries, &c. are the best to remove, as I have already observed; but as the removing of Trees is commonly upon the account of the making of Walks, Avenues, Groves, or to fill up Hedge-rows where Cattle come, it's necessary that they should be of a size so big, as with some shelter they may be out of danger of being spoiled by Cattel; for which purpose, I reckon Trees that are of about five or six Inches in Circumference, and six Foot and a half or seven Foot high, to be the best, and the best size both upon  
account

account of the Trees and of the Cattles reaching to crop them. In cases of necessity, Trees of very great Stature have, according to the account given by Mr. *Evelyn*, been removed upon particular occasions ; the way of doing of which, tho' it is too troublesome for ordinary planting, yet as it may be of use upon some occasions, I shall propose it according to the method he has laid down, which is,

To chuse a Tree as big as your Thigh, remove the Earth from about it, cut thro' all the side Roots till you can with a competent strength enforce him down on one side, so as to come with your Ax at the Tap-root, which cut off, and redressing your Tree, let it stand covered with the Mould you loosened from it, till the next Year or longer, if you think fit, take it up at a fit Season, and it will have drawn new tender Roots fit for Transplantation.

Or else a little before the hardest Frost surprize you, you may make a Trench about the Trees at such distance from the Stem, as you judge sufficient for the Root, which dig of a competent depth so as almost to undermine it by placing of Blocks and Quarters of Wood to sustain the Earth ; this done, cast in as much water as may fill the Trench, or at least sufficiently wet it, unless the Ground were very wet before ; let it stand till some very hard Frost doth firmly bind the Earth to the Roots, and then convey it to the Pit prepared for its new Station, which you may preserve from freezing by laying store of warm Litter in it, and so close the Mould the better to the straggling Fibres, placing what Earth you take out about your new Guest to preserve it : but in case the Mould about it be so ponderous as not to be removed by any ordinary force, you may then raise it with a Crane or Gin, and by this means you may  
trans-

transplant Trees of a large Stature to supply any defect, or for the removal of a curiosity: the best sort of Trees to remove large is the *Elm*, especially if to be placed in a moist place.

The best time for the removing of all Trees, except Winter Greens, of which I have particularly treated, is either in *October* or *February*, as I said before: tho' I have several times for a curiosity removed some sort of Trees at *Midsummer*, that have prospered very well, which I did after this manner; I made a hole large enough to contain the Roots of the Tree I designed to remove, into which I poured water, and in that water I put the Earth I took out of the hole, so as to make it a meer soft Sludge or Mud, and having taken up my Tree with as many Roots as I could, and abated the Head with the same caution, I plunged the Root into the Mud in the hole, where I let the Tree stand without taking any further care of it, except daily watering for about a Fortnight or three Weeks: and such Trees have grown as well as those planted in Winter, but then they were small Trees. But as for the common Rules of Planting,

1. Observe to set your Trees deeper in light Ground than in strong, but shallowest in Clay; six Inches is sufficient for the driest, and two or three for the moist, provided you establish them from the Winds, and shade them from the heat of the Sun; the best way of doing which, is by Stakes, and round the Stem of the Tree to raise a small Hill about two Foot thick, and four or five Foot in Diameter, which cover with Stones, Tiles, or mungy Straw, to keep it moist, and to prevent the Weeds growing, taking care after a competent time to remove them, else the Vermin, Snails and Insects which they produce and shelter, will gnaw and injure the Bark. Abate about half a Foot of the height of

of the Hill, every Year, till they become level with the rest of the Earth round the Tree, and carefully pull up what Weeds grow about them, because they draw away the heart of the Soil which should give nourishment to the Tree.

2. Where you dig your Holes for Trees, if it is in a Gravel Soil or Sand, mix Clay, or, which is better, Earth, Loam or Mud with the Earth you fill into the Holes again; and if it is a stiff Clay, trench it with Straw, Thatch, Litter, Wood-Stack-Earth, &c. but let not the Roots touch any of these Mixtures, nor yet any Dung or Turf, but lay your Dung rather round upon the Surface of the Earth, and dig it in a little, covering of it with Mould to keep the Sun from drying of it. When you dig down your Hills, or dig about the Roots of your Trees, (which you should mind carefully to do once a Year, the advantage of which I will prove to you afterwards) and where-ever you plant Trees, make your Earth as fine as you can.

3. For Trees or most sorts of Plants, the strong blue, white or red Clay are some of the worst Soils; but if any of these Lands have some Stones naturally in them, or the nearer they are to a Loam, by any mixture of Sand, they are much the better; so likewise is gravelly or sandy Grounds, the nearer they are to a Loam, by a mixture of Clay; for a Loam or light brick Earth, composed of a due mixture of Clay and Sand, I reckon to be the best Land for Trees.

4. Plant in a warm moist season, the Air being tranquil and serene, the Wind westerly, but never when it freezes, rains, or is misty, for it moulds and infects the Roots; and if you water any Trees you have new planted, it will settle the Earth the better to the Roots, and keep them moist.

5. Trees



5. Trees that have not been transplanted, or others that have, if their Roots go deep, you must have them abated, or else you will be necessitated to place them too deep; only the small fibrous Roots must be spared as much as you can, for they are what affords the chief nourishment to the Trees, and take them up with as much Earth as you can, letting the Holes, into which you transplant them, be left open for the Rain, Frost and Sun to mellow the Earth sometime before you plant them.

6. If you take up a Tree, mind how the Roots grow, and dispose of them in the same order where you new place them, spreading of the Roots carefully; observing to place the Tree to the same Aspect that it grew before.

7. In the Spring rub off the side Buds to check the exuberancy of the Sap in the Branches, and to cause it to run up to the Head.

8. Transplant no more Trees than you can fence well from Cattel; especially from Sheep, the Grease of whose Wool is very prejudicial to Trees, where they can only come at them to rub them. All young Trees should likewise be defended from the Wind and Sun; especially those of a tender sort from the *North* and *East*, till their Roots are fixed, and that you find them begin to shoot; the not exactly observing of which point is the cause of the perishing of most of our Plantations in Summer; and in Winter there is more danger to be feared from wet and cold, in conjunction one with another, than the severest Frost alone.

9. Wood well planted will grow in moorish, boggy, heathy and the stoniest Ground; only the white and blue Clay is the worst for Wood, as I said before; and what large Timber you find in

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either

either of them (the Oak only excepted) is of a very great age.

10. If the season require it, all new Plantations are to be well watered, in *April* at their first budding, especially the first Year of their planting, upon which depends much of their future growth; and what Water you pour on them let it be in a Circle, at some distance from the Roots, which should continually be bared of Grass and Weeds; and if the Water be rich, or impregnated with any Manure, the Shoots will soon discover it, for the Liquor being percolated or strained thro' the Earth, will carry the nitrous virtue of the Soil with it: By no means water at the Stem, because it washes the Mould from the Roots, and lets the Water come too crude to them, which often endangers their rotting. If you fear dry weather, do not defer too long before you water your Trees or Seeds, but water while your Ground is yet moist that it may keep so.

11. Young Trees will be strangled with Corn, Oats, Pease, Hemp or any rank growing Corn or Weeds, if a competent Circle and Distance be not left (as of near a Yard or so) from the Stem.

12. Cut no Trees that have any large Pith in them, especially being young and tender, when either Heat or Cold are in their extrems; nor in wet or snowy weather, tho' the discharging Trees of unthrifty broken wind-shaken Boughs is a very great advantage to them when done in a good season. *Ever-greens*, especially such as are tender, prune not just after planting, but when you find by some small fresh Shoot they have taken Root.

13. If you plant Fruit-trees, reduce them to a Head as soon as you can. As for Timber-trees, it is best not to head them at all, but to shred them up to one single Bough, if the Soil be good that  
you

you plant them in; but if bad, the Sap will hardly run so high; and therefore in such case it is better to head them; and when they are shot out, reduce the Head to one single Branch; for which purpose, leave one of the most upright and thriving Boughs; and if your Top die, or your Tree meet with any prejudice from Cattel, so as to occasion its breaking out of the sides, which impedes both its growth and spring, prune off some of the Shoots, and quicken a leading Shoot with your Knife at some distance beneath its infirmity; but if it be in a very unlikely condition at Spring, cut off all close to the Ground, and hope for a new Shoot, which nurse up by cutting away all superfluous Branches. If you would not have a Tree put forth side-Branches, prune them up in *February*; and whatsoever side-Branches it puts out after, cut off at *Midsummer*, when the Sap is in them, and they will hardly ever sprout again; tho' you must be cautious not to cause your Tree to have too great a Head for the Body; especially if it is of a tender Wood, lest the Wind break it; the way to prevent which, is lopping or thinning of the Head, or letting of the more side-Boughs grow out of it to check the Sap from running all into the top Branches.

14. *Wallnut*, *Ash* and *Pithy* Trees you must by no means head when you transplant them; especially the *Wallnut*; and if you have occasion to lop off any of the Boughs, do it where they may be the least expos'd to the wet, which I reckon the side-Boughs to be; and late in the Spring, as about the latter end of *February* or beginning of *March*, that the Bark may the sooner heal the Wound.

To preserve Trees from Winds and Cattel that are expos'd to them, empale them with three or four quarter Stakes of a competent height, set

triangular or quadrangular, and fasten them by one another with short pieces above and beneath, in which a few Brambles may be stuck; except you will be at the charge of Pales, which will secure them without that fretting which Trees are otherways liable to that are only single stak'd and bush'd; but where Cattel don't come, a good piece of Rope ty'd about the Neck of the Tree upon a wisp of Straw to preserve them from galling, and the other end lightly strained to a Hook or Peg in the Ground, will sufficiently stablsh the Tree against the Western Blasts, the Winds of other Quarters seldom doing them much mischief. If the Cords are well pitched they will last many Years.

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### Chap. III. *Of Planting of Avenues, Walks, &c.*

**M**OST Walks should be made to lead to the Front of an House, Garden-gate, Highway-gate, or Wood, or to terminate in a Prospect; in all which cases most People are apt to plant their Walks too narrow, so as not to give a fair prospect of what they are design'd for; as suppose them planted for an Avenue to an House, whatever the length of the Walk is, it ought to be as wide as the whole breadth of the Front; and if it be long, the wider it is, the better: And for Walks to Woods, Prospects, &c. they ought to be at least sixty Foot in breadth; and because such Walks are a long time before they are shady, I would propose to plant a narrower Row on each side, rather than lose the stateliness that the main Walk will afford by being broad, especially where any thing of a Prospect is to be gained; and if the Trees are any thing of a spreading kind, I would not have them planted nearer together than thirty five

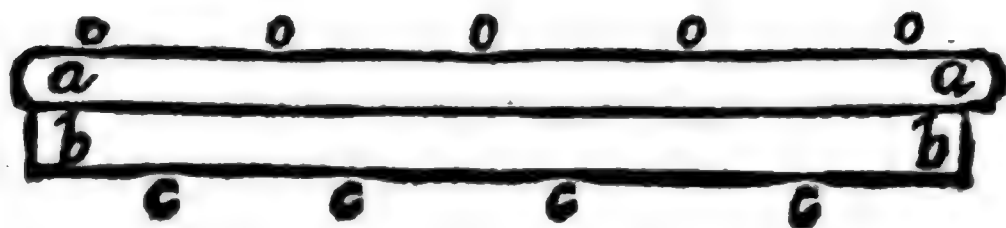


by five or forty Foot in the row; and the same distance is to be observed if they are planted for a regular Grove.

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**Chap. IV. *Of the Planting of Trees in Hedges.***

**T**HE best way of raising Trees in Hedges, is to plant them with the Quick, if you can preserve them well from Cattel; but where Hedges are planted already, and Trees are wanting, I should propose to plant them after this manner, as doing least Damage to the Hedge, and as affording the best Shelter, and giving room for the greatest number of Trees to be planted. Let *aa* be the Bank that the Hedge stands on, and *bb* the Ditch, and let all the Trees be planted not on the Bank



where the Hedge stands, as the common way is, but at the bottom of the Bank about a yard from the Hedge; which will prevent their dropping on it, as at *oooo*: and over-against them, on the other side of the Ditch, about a yard from it, not in a direct Line, but in the Intervals, let another Row be planted, as at *cccc*; and if each other of these Trees be a spiring Tree, and the odd one between, a Fruit-tree to spread, they may be planted the nearer together, and will afford the better Shelter.

Chap. V. *Of the Infirmities of Trees.*

**T**Here are several Diseases and Casualties that spoil Trees, and affect the several parts of them, that are carefully to be looked after.

1. Weeds, such being diligently to be plucked up by hand after Rain as can be so eradicated ; especially while the Trees are young and not able to over-drop them ; but for the stronger Weeds, they must be extirpated with the Howe, Spade, or other Instrument, being very prejudicial to the Trees in robbing them of their Nourishment, and in choaking such as are young.

2. Suckers should be cut off close to the place they put out from, opening the Earth that you may come well at them ; and if you find them rooted, you may set them again : but they say, Trees grafted upon them are more apt to produce Suckers than other Trees.

3. Over-much Wet often prejudices Trees ; especially such kinds as require drier ground, which is to be helped by Drains ; and if a Drip fret the body of a Tree by the Head (which will certainly decay it) cut first the place smooth, and apply to it, so as to cover the Wound, some Loam or Clay mixed with Horse-dung, which keep to it till a new Bark succeed.

4. If a Tree is Bark-bound, slit through the Bark from the top to the bottom in *February* or *March*, which will do most Trees good, but no harm to any ; and if the gaping be much, fill the Rift with Cow-dung : also the cutting off of some Branches is profitable, especially such as are any ways blasted or Lightning-struck ; and so is digging about the Tree, it being many times occasioned from the baking of the Earth about the Stem.

5. The *Teredo*, *Cossi*, and other Worms lying  
between

between the Body and the Bark, poison the passage of the Sap, to the great prejudice of the Trees; but the Holes where they lie being found out, open them, and make a small slit from the bottom of them to let any moisture that may fall in them, run out, and do the Place over with Loam.

6. Trees, especially Fruit-bearers, are often infected with the Measles by being burn'd and scorched with the Sun in great Droughts. To this commonly succeeds Loufiness, which is cured by boring a hole into the principal Root, and pouring in a quantity of Brandy, stopping the Orifice up with a pin of the same Wood.

7. Excorticated and Bark-bared Trees may be preserved by nourishing up a Shoot from the foot or below the stripped place, cutting the body of the Tree sloping off a little above the Shoot, and it will quickly heal and be covered with Bark like a Tree new grafted; and if you cover the top with Clay and Horse-dung in the same manner as you do a Graft, it will help to heal the sooner.

8. Deer, Conies, and Hares, by barking of Trees, often do them very great mischief, and many times destroy them quite. To preserve them from Deer, fence them with Pales; but to preserve them from Conies and Hares, Mr. Evelyn proposes the anointing of them with *Stercus humanum* tempered with a little Water or Urine and lightly brushed on, this to be renewed after every Rain, or to sprinkle Tanners Liquor on them, which they use for dressing their Hides; also tie Thumb-bands of Hay or Straw round them as far as they can reach. I have not experienced any of these ways; but Tar and Lime, which I have known some use, will bind the Bark, and make it so hard that the Tree will not thrive.

9. Moss is to be rubbed and scraped off with some fit Instrument of Wood which may not hurt

*Vid. Book 14.  
Ch. 8.*

the Bark of the Tree, or with a piece of Hair-cloth, after a soaking Rain. But the most certain way to cure it is by taking away the Cause; which is, to drain the Land well from all superfluous Water, and to prevent it in the first planting of your Trees by not setting them too deep.

10. Ivy, Briony, Honey-suckles, and other Climbers, must be dug up, lest they spoil your Trees by pinching and making them crooked.

11. Wind-shock is a Bruise and Shiver throughout the Tree, but not always visible, twisting the Warp from smooth-renting, being occasioned by High-winds, and perhaps by subtil Lightnings, those Trees being most in danger of it whose Boughs grow more out on the one side than the other. The best prevention is Shelter, choice of place for the Plantation, and frequent shredding up while young.

But as the Winds often spoil Trees by twisting them, they many times do them as much mischief in prostrating of them; which, tho' it cannot properly be called an Infirmary of the Tree, yet the Winds are many times a principal cause of rendering them infirm; for which there is no better Remedy than what is already proposed: but in case any Trees should chance to be blown down which you desire to preserve or redress, be not over-hasty to remove them, but cut off their Heads, and let them lie, and many times the weight of the Roots will bring them up; but if not, take some of the loose Earth out of the Hole that the Tree hath made, and cut off some of the straggling Roots that hinder it from falling back, and you may easily redress them.

12. Cankers are caused by some stroke or galling, or by hot burning stony Land. They must be cut out to the quick, and the Scars emplastered with Tar mingled with Oyl, and over that Loam  
this



thin spread; or else with Clay and Horse-dung, but best with Hogs-dung alone bound to it with a Rag, or by laying Ashes, Nettles, or Fern to the Roots, &c. But if the Canker be in a Bough, cut it off; if a large Bough, at some distance from the body of the Tree; but if a small one, cut it close to it. But for over-hot stony Land, you must cool the Mould about the Roots with Pond-mud and Cow-dung: and for Fruit-trees, the best way to raise them on such Land is to graft them on Crab-stocks raised in the same Mould.

13. Hollowness is contracted by the ignorant or careless Lopping of Trees, so as that the Wet is suffered to fall perpendicularly upon any part of it, especially the Head: in this case, if there is sufficient sound Wood, cut it to the quick close to the Body, so as to make it as sloaping as you can, that the Wet may fall from it, and cap the hollow part with a Tarpaulin, or fill it with good stiff Loam, Horse-dung, and fine Hay mixed together. This is one of the worst Evils belonging to Trees, and what all soft Woods are very liable to if lopped; especially the *Elm*, which is much better to be shred up, the Side-boughs of which will yield a constant Lop, and the Bodies afterwards be good Timber, whereas when lopped they soon decay and perish; tho' many times a Spire *Elm* will begin to grow hollow at the bottom when any of its Roots happen to perish; but the Unthriftness of its Branches will quickly discover it.

14. Hornets and Wasps do mischief to Trees by breeding in them, which are destroyed by fuming of their Cells in the night with Brimstone, or by stopping up their holes with Tar and Goose-dung.

15. Earwigs and Snails do seldom infect Timber Trees, but are very prejudicial to Fruit; and so are likewise Pismires, Caterpillars, Mice, Moles,

Moles, &c. of which I have already treated.

Mice, Moles, and Pismires, cause the Jaundice in Trees, which is known by the discolour of their Leaves and Buds.

16. Blasted parts of Trees are to be cut away to the quick; and to prevent it in the blossoms, smoak them in suspicious Weather by burning moist Straw or the superfluous Cuttings of aromatick Herbs, as Rosemary, Lavender, Juniper, &c.

17. Rooks do great prejudice to Trees by cropping off the tops of old ones, and by lighting on young ones, whose weight breaks the tender branches and often spoils their tops: they also destroy Seedlings where they breed, and their Dung breeds Nettles and Weeds.

## Chap. VI. *Of Pruning Forest-trees.*

**A**S to the pruning of Trees, it is a Work that requires a great deal of Skill and Care, and for which general Rules cannot well be given, because of the great variety which is met with in doing of it; only you may observe, that whatsoever Shape you design your Tree shall have, form it to that Shape as much as you can while it's young, because young ones will best bear pruning, when their Boughs are small, and soonest heal when cut off: but for those Trees which you design for Timber, be cautious of cutting off their Heads, as I told you before, especially those that have great Piths, as the *Ash*, *Wallnut*, &c. and all soft Woods, as the *Elm*, *Poplar*, &c. But if your Trees grow too top-heavy, you must abate the Head to lighten them, which in many Trees it's better to do by thinning of some of the Boughs that shoot out of the sides of the main Branches, so as to let the Wind have a Passage through them, than by cutting

ting off the main Branches themselves, especially if you design them for spreading Trees; but if you design them for spiring Trees, it is best done by rubbing off the Buds as they put out in Spring, and by shredding up the side-Shoots, which must be done sparingly, so as to leave here and there a Bough; and when any new Shoots put out, you may save them and cut off the former, always taking care to cut off the largest, and leave the smallest to give a check to the Sap where it runs too much up to the Head, so as to endanger the breaking of it where the Body is too weak; but where it is strong and able to bear it, you may be the bolder in shredding of it up, minding alway to proportion the Head to the Body by keeping of it small, and by maintaining of the leading Shoot, and particularly taking care that it do not run up with a Fork till you have got your Tree to the intended height, then let the Head break out, and cut off all the side-Boughs. If you find the side Boughs still breaking out, and that your Top is able to sustain it self, to the Boughs that put out in Spring, give a Summer pruning a little after Midsummer, cutting them very close; this will cause the Bark to cover them and kill them so as not to shoot out again, as I said before; which is the only way to make your Tree grow with a fine streight handsome Body. But I know most are against pruning Timber Trees at all; and I grant that where Trees do naturally grow streight it is better; but I cannot think the pruning of a young Tree, provided you cut the Boughs close, can do them any great harm; because I believe if they heal the Wound quite, or if they do not, the Cut lying near the Pith can be no prejudice if the Tree is used for a Beam, or for any other occasion where it is used square; or for any other Uses that require its being quartered; because it  
brings



brings any such Defects to be near the edge, and so the four parts will be sound: As for great Trees, that is, Forest Trees (for of Fruit-Trees I design to treat in another place) I am not for pruning them at all, except in cases of very great necessity; and in such cases avoid the cutting off large Boughs as much as you can: but whatsoever Boughs you cut off, if it is small cut, it off smooth and close, so as the Bark may quickly cover it; and sloaping, so as the Water may run off and not soak into it; but if the Bough is large, and the Tree old, cut it off at some distance from the Tree, as at three or four foot, or where you find any young Shoots coming out of the sides of it; but by no means leave any Stumps to stand out at any distance, because they cannot be covered by the Bark till the diameter of the Tree grows beyond it, and in the mean time the Stump will be continually rotting, and a Conduit-pipe to convey Water to the heart of the Tree, which will certainly decay and kill the whole Body: and all Boughs that grow upright, be they great or little, cut them not right cross over, but sloaping upwards; and those Boughs that lean from the Head, cut the sloap on the lower-side; and if you have occasion to make any great Wounds, cover them over with Clay mixed with Horse-dung, and they will heal the sooner, as I said before.

But if your Tree grow crooked, at the crooked place cut it off sloaping upwards, and nurse up one of the principal Shoots to be a leading Shoot, except it is of such a sort as is subject to die when headed, of which the *Beech* is one of the worst to head; or if any Trees are very great, do not meddle with them; but crooked Trees may be made streight by shredding up of the Side-branches till you come above the Crook, where they are young.

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The best time to prune Trees is in *February*, which should be repeated where need of pruning is every Year or every second Year, that so the Tree may easily over-grow the Knot, and the place will not be very subject to put forth Suckers, because the Sap hath had no great Recourse to it; only observe, that if you are to cut a Bough of any bigness, that you give it a chop or two underneath, lest when it falls it strip part of the Bark away with it; and likewise, that if you keep any Trees for Pollards, that you head them every ten Years; for if you let the Boughs grow large, they will be the longer before the Bark covers them, and be apt to let Water into the body, which will soon spoil their bearing of Lop. Vid. *Pruning of Fruit-Trees*, Book 14. Chap. 18.

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### Chap. VII. *Of the Age and Stature of Trees.*

**A**S to the Age, Stature, and Growth of Trees, I shall refer you to Mr. *Evelyn*, who is very copious in this particular; and only observe, that the Growth of most Trees, for the Circumference of them (it being easily seen what length the Top-shoots grow) is from about one to two Inches in a Year, and that the Increase of small and large Trees is much the same, provided they are alike thrifty. I have an Oak that grows in the middle of a Corn-field that is constantly plowed about, and the Cattle often lie under it and dung it, growing upon a red brick Earth, that is at least forty foot deep, whose increase is some Years four inches in a Year, whereas the common Growth of other Trees is but about an inch and a quarter or an inch and a half in circumference; which shews the advantage of what I proposed before, of digging and dunging about Trees, and of killing the Weeds about

about them, which I reckon the greatest Prejudice of any thing to the Growth of Trees, in drawing away the heart of the Ground from them: and I am satisfied by several Measures that I have taken of the Growth of Trees, that Bushes and Underwood (tho' they are by many esteemed to be as prejudicial as Weeds) are a very great help to the Growth of Trees; and the greatest of any, except digging and dunging about them; for they both improve the Land, and keep their Roots moist. But as I find an Account of very great and quick Growth of Trees in several Authors, I would desire, that where any such Growth of Trees is, that they that are willing to encourage Husbandry would be pleased to measure the Circumference that they grow in a Year, and likewise to be particular in inquiring into the Nature of the Soil, and likewise into the Depth of that Soil they grow upon, and to communicate it to the Publishers, that I may be able, in my *Appendix*, to give an Account what sort of Land it is that is most likely to be so improved by Trees; which will be an Advantage for those to know that have Land of the same kind, and likewise an Encouragement to the Planting and Raising of Timber.

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### Chap. VIII. *Of the Felling of Trees.*

**I** Have already given an Account of the Signs that shew the Unthriftness of a Tree: and therefore when you are resolved to fell any of them, the first thing to be taken care of is a skilful disbranching such Limbs as may endanger them in their Fall, wherein much Forecast and Skill is required, many Trees being utterly spoiled for want of this care; and therefore in Arms of  
Timber

Timber that are very great, chop a Nick under them close to the Bole; and so meeting it with downright Strokes, it will be severed without splitting, as I said before.

2. In felling of Timber take care to cut them as near the Ground as possible, unless you design to grub them up, which to do is of Advantage both for the Timber and Wood, because they do not reckon the Timber good that grows out of old Stools. The price of Felling of Trees is 12*d* per Load, and 3*s*. a Load hewing.

When your Tree is down, strip off the Bark, and set it so as it may dry well, and be well covered from the Wet in case of Rain; and then cleanse the Bole of the Branches that are left, and saw it into Lengths, if you do not sell it to the Timber-buyers to do it for themselves.

The common way of dealing with whom, is to sell your Timber as it stands, (which is a very uncertain way) or by the Ton, Load, or Foot, forty Foot being reckoned a Ton, and Fifty a Load, which you measure either by girt or square Measure. They reckon that forty Foot of round Timber, or fifty Foot of hewn or squared Timber weighs the same, that is, 20 hundred, which is commonly accounted a Cart-load; and as they seldom strip the Bark off of Elm or Ash, they commonly allow one Inch for the Bark, which is a great deal more than it comes to: and therefore if you can strip off the Bark in the measuring-place, which should be always about the middle of the Tree, it will be better. Some allow four Foot out of every Load for Ash, and five Foot for Oak and Elm: and as for the computation of the Feet, if it is square Measure, the square is taken by a pair of Cannipers, or two Rulers clap'd to the side of the Tree, measuring the distance between them; and if the Sides are unequal, they add them together,

gether, and take half the Sum, which they account the true side of the square: but if girt Measure, by girding of the middle of the Tree with a Line, and taking a quarter-part of that girt for the square, measuring the Length from the Butt-end so far forwards till the Tree comes to be 6 inches girt, that is, 24 inches in circumference; and if the Trees have any great Boughs which are Timber, that is, which hold six inches girt, they measure them by themselves and add them to the whole: for the casting up the Contents of which, they make use of *Gunter's Line*, upon which if you extend your Compasses from 12 to the number of inches contained in the square, and placing one foot of the Compasses at the length, and keeping of the same extent with your Compasses, if your Square is under 12 inches turn your Compasses twice towards 12; if above, twice from 12, and it will shew you the Contents: The way of doing which, any one that understands it will shew you in a very little time; which way, tho' it is a false way of measuring, being near a fifth part short of its true measure, yet it being the common practice, you must be guided by it. But as many of the Rules are false, and that upon several Occasions and Disputes it may be necessary to try your Measure several ways, I shall first propose the doing of it by common Arithmetick: As, Suppose a Tree 40 inches girt, and 30 foot long; the 4th part of 40 inches is 10 inches: now,

The Rule is as 12 to 10 the square inches,  
So is 30 foot the length to a 4th Number;  
and that 4th Number tells you the Contents in feet.

But to work this the common way, take the fourth part of the Circumference to be the side of the Square of the Tree (tho' erroneous) and mea-  
sure



ture it as a Cylinder. The 4th part of 40 is 10, which multiply'd by it self is 100: and 30 foot the length multiply'd by 12 makes 360, which multiplied by 100, the Square of the Tree, gives 36000, the number of square inches in the Tree: which Sum divided by 1728 the square inches that are in a solid foot, gives 20 feet and about three fourths, the odd Fractions being no ways material in Timber-Measure.

$$\begin{array}{r}
 10 \\
 10 \\
 \hline
 100 \\
 30 \\
 12 \\
 \hline
 60 \\
 30 \\
 \hline
 360 \\
 360 \\
 \hline
 100 \\
 36000
 \end{array}$$

$$\begin{array}{r}
 14 \\
 12840 \\
 38800 \quad (20 \frac{1440}{1728} \\
 27288 \\
 172
 \end{array}$$

Now to try this by the following Table, look for 10 inches in the Left-hand Column, and for 30 foot at the top, which is the Length, and you will find 20 foot and (82 parts of a hundred, which is about) three fourths of a foot.

The following Table of girt and square Measure, Numb. 1. is what you may see the Contents of any piece of Timber by, according to the common way of measuring Timber, from half an inch square to 36 inches, and in length from 1 foot to 30.

EXAMPLE.

Suppose a Tree the Circumference of which is 136 inches as girt by the Line, which doubled four times makes the square or quarter part 34 inches: which Number look for in the first Column of the following Table, and supposing the Length of the Piece to be 9 foot, in the Column under 9, against 34 Inches, you will find 72: 25, which is 72 feet and 25 of the hundredth parts of a foot, which makes 72 feet and a quarter; which is the Contents of a piece of Timber of that Dimension.

## A Table of Girt and Square Meas. N.I.

The Length of the Timber in Feet.

The Square of Timber in Inches and Half-inches.

In.	1		2		3		4		5		6	
	Ft.	Pt.	Ft.	Pt.	Ft.	Pt.	Ft.	Pt.	Ft.	Pt.	Ft.	Pt.
1	0	00	0	00	0	00	0	01	0	01	0	01
	0	01	0	01	0	02	0	03	0	03	0	04
	0	01	0	03	0	05	0	06	0	08	0	09
2	0	03	0	05	0	08	0	11	0	14	0	17
	0	04	0	08	0	13	0	17	0	21	0	26
3	0	06	0	12	0	18	0	25	0	31	0	37
4	0	08	0	17	0	25	0	34	0	42	0	51
	0	11	0	22	0	33	0	44	0	55	0	66
	0	14	0	28	0	42	0	56	0	70	0	84
5	0	17	0	35	0	52	0	69	0	81	1	04
	0	21	0	42	0	63	0	84	1	05	1	26
6	0	25	0	50	0	75	1	00	1	25	1	50
7	0	29	0	58	0	88	1	17	1	46	1	76
	0	34	0	68	1	02	1	36	1	70	2	04
	0	39	0	78	1	17	1	56	1	95	2	34
8	0	44	0	89	1	33	1	77	2	22	2	66
	0	50	1	00	1	50	2	01	2	51	3	01
9	0	56	1	12	1	68	2	25	2	81	3	37
10	0	63	1	25	1	88	2	51	3	13	3	76
	0	69	1	39	2	08	2	87	3	47	4	16
	0	76	1	53	2	29	3	06	3	82	4	59
11	0	84	1	68	2	52	3	36	4	20	5	04
	0	92	1	84	2	76	3	67	4	59	5	51
12	1	00	2	00	3	00	4	00	5	00	6	00

The Square of Timber in Inches and Half-inches.

A Table of Girt and Square Meas. N.1.						
The Length of the Timber in Feet.						
In.	7	8	9	10	20	30
	Ft. Pt.	Ft. Pt.	Ft. Pt.	Ft. Pt.	Ft. Pt.	Ft. Pt.
1	0 01	0 01	0 02	0 02	0 04	0 06
2	0 05	0 05	0 06	0 07	0 14	0 21
3	0 11	0 13	0 15	0 16	0 32	0 48
4	0 19	0 22	0 25	0 28	0 56	0 84
5	0 30	0 34	0 39	0 43	0 86	1 29
6	0 43	0 49	0 56	0 62	1 24	1 86
7	0 59	0 68	0 76	0 85	1 70	2 55
8	0 78	0 89	0 99	1 11	2 22	3 33
9	0 98	1 12	1 26	1 40	2 80	4 20
10	1 22	1 39	1 56	1 74	3 48	5 22
11	1 47	1 68	1 89	2 10	4 20	6 30
12	1 55	2 00	2 25	2 50	5 00	7 50
13	2 05	2 34	2 64	2 93	5 86	8 79
14	2 38	2 72	3 06	3 40	6 80	10 20
15	2 73	3 12	3 51	3 90	7 80	11 70
16	3 11	3 55	3 99	4 44	8 83	13 32
17	3 51	4 01	4 52	5 02	10 04	15 06
18	3 93	4 49	5 06	5 62	11 24	16 86
19	4 29	5 01	5 64	6 27	12 54	18 81
20	4 86	5 55	6 24	6 94	13 88	20 82
21	5 35	6 12	6 88	7 65	15 30	22 95
22	5 88	6 72	7 56	8 40	16 80	25 20
23	6 43	7 35	8 27	9 19	18 38	27 57
24	7 00	8 00	9 00	10 00	20 00	30 00

**A Table of Girt and Square Meas. N.I.**

The Length of the Timber in Feet.

The Square of Timber in Inches and Half-inches.

In.	1	2	3	4	5	6
	Ft. Pt.	Ft. Pt.	Ft. Pt.	Ft. Pt.	Ft. Pt.	Ft. Pt.
13	1 08	2 17	3 25	4 34	5 42	6 51
	1 17	2 35	3 51	4 69	5 87	7 04
	1 26	2 53	3 80	5 06	6 33	7 59
14	1 36	2 72	4 08	5 44	6 80	8 16
	1 46	2 92	4 38	5 80	7 30	8 76
15	1 55	3 12	4 68	6 25	7 81	9 37
16	1 67	3 33	5 00	6 67	8 34	10 01
	1 78	3 55	5 33	7 11	8 89	10 67
	1 89	3 78	5 67	7 56	9 45	11 34
17	2 1	4 01	6 02	8 03	10 03	12 04
	2 13	4 25	6 38	8 51	10 63	12 76
18	2 25	4 50	6 25	9 00	11 25	13 50
19	2 38	4 75	7 13	9 51	11 88	14 26
	2 51	5 01	7 52	10 03	12 53	15 04
	2 64	5 28	7 82	10 56	13 20	15 64
20	2 78	5 55	8 33	11 11	13 89	16 67
	2 92	5 83	8 75	11 67	14 59	17 51
21	3 06	6 12	9 18	12 25	15 31	18 37
22	3 11	6 42	9 63	12 84	16 05	19 26
	3 36	6 72	10 08	13 44	16 80	20 16
	3 51	7 03	10 55	14 06	17 58	21 09
23	3 67	7 34	11 02	14 69	18 36	22 04
	3 33	7 67	11 50	15 34	19 17	23 01
24	4 00	8 00	12 00	16 00	20 00	24 00



A Table of Girt and Square Meas. N.1.

The Length of the Timber in Feet.

In.	7		8		9		10		20		30	
	Ft.	Pt.	Ft.	Pt.	Ft.	Pt.	Ft.	Pt.	Ft.	Pt.	Ft.	Pt.
13	7	51	8	68	9	76	10	85	21	70	32	55
	8	22	9	39	10	56	11	74	23	48	35	22
	8	86	10	13	11	39	12	66	25	32	37	98
14	9	53	10	89	12	25	13	61	27	22	40	83
	10	22	11	68	13	14	14	60	29	20	43	80
15	10	93	12	49	14	06	15	62	31	24	46	86
16	11	67	13	34	15	01	16	68	33	36	50	04
	12	44	14	22	16	00	17	78	35	56	53	34
	13	24	15	13	17	02	18	91	39	82	58	73
17	14	05	16	05	18	06	20	07	40	14	60	21
	14	89	17	01	19	14	21	27	42	54	63	81
18	15	75	18	10	20	25	22	50	45	00	67	50
19	16	64	19	01	21	39	23	77	47	54	71	31
	17	55	20	05	22	56	25	07	50	14	75	21
	18	49	21	13	23	77	26	41	52	82	79	23
20	19	40	22	22	25	00	27	78	55	56	83	34
	20	42	23	34	26	26	29	18	58	36	87	54
21	21	43	24	49	27	56	30	62	61	24	91	86
22	22	47	25	68	28	89	32	10	64	20	96	30
	23	53	26	89	30	25	33	61	67	22	100	83
	24	61	28	13	31	64	35	16	70	32	105	48
23	25	77	29	38	33	06	36	73	73	46	110	19
	26	84	30	68	34	51	38	35	76	70	115	05
24	28	00	32	00	36	00	40	00	80	00	120	00

## A Table of Girt and Square Meas. N.I.

The Length of the Timber in Feet.

The Square of Timber in Inches and Half-inches.

In.	1	2	3	4	5	6
	Ft. Pt.	Ft. Pt.	Ft. Pt.	Ft. Pt.	Ft. Pt.	Ft. Pt.
25	4 16	8 33	12 50	16 66	20 83	24 99
	4 34	8 68	13 02	17 36	21 70	26 04
	4 51	9 02	13 54	18 05	22 56	27 08
26	4 69	9 39	14 08	18 77	23 47	28 16
	4 88	9 75	14 63	19 51	24 38	29 26
27	5 06	10 12	15 19	20 25	25 31	30 38
28	5 25	10 50	15 75	21 00	26 85	31 50
	5 44	10 89	16 33	21 78	27 22	32 67
	5 67	11 34	17 01	22 68	28 35	34 02
29	5 84	11 68	17 52	23 36	29 20	35 04
	6 04	12 08	18 13	24 17	30 21	36 26
30	6 25	12 50	18 75	25 00	31 25	37 50
31	6 46	12 91	19 38	25 84	32 30	38 76
	6 67	13 34	20 02	26 69	33 36	40 04
	6 89	13 78	20 67	27 56	34 45	41 34
32	7 11	14 22	21 33	28 44	35 55	42 66
	7 33	14 66	21 99	29 33	36 66	43 99
33	7 56	15 12	22 68	30 24	37 81	45 37
34	7 78	15 56	23 34	31 12	38 90	46 68
	8 03	16 05	24 08	32 11	40 14	48 17
	8 26	16 52	24 79	33 05	41 31	49 58
35	8 54	17 01	25 52	34 03	42 53	51 04
	8 70	17 50	26 25	35 00	43 75	52 50
36	9 00	18 00	27 00	36 00	45 00	54 00

The Square of Timber in Inches and Half-inches.

A Table of Girt and Square Meas. N. 1.

The Length of the Timber in Feet.

In.	7	8	9	10	20	30
	Ft. Pt.	Ft. Pt.	Ft. Pt.	Ft. Pt.	Ft. Pt.	Ft. Pt.
25	29 16	33 33	37 49	41 66	83 32	124 98
	30 38	34 72	39 06	43 40	86 80	130 20
	31 59	36 10	40 62	45 13	90 26	135 39
26	32 86	37 55	42 24	46 94	93 88	140 82
	34 14	39 01	43 89	48 77	97 54	146 31
27	35 44	40 50	45 57	50 63	101 26	151 89
28	36 75	42 00	47 25	52 50	105 00	157 50
	38 11	43 56	49 00	54 45	109 35	164 35
	39 69	45 36	51 03	56 70	113 40	170 10
29	40 88	46 88	52 56	58 40	116 80	175 20
	42 30	48 34	54 39	60 43	120 86	181 29
30	43 75	50 00	56 25	62 50	125 00	187 00
31	45 22	51 68	58 14	64 60	129 20	193 80
	46 71	53 36	60 06	66 50	133 00	199 00
	48 23	55 12	62 01	68 40	136 80	204 20
32	49 78	56 89	63 99	71 11	142 22	213 33
	51 33	58 66	65 99	73 33	146 66	219 99
33	52 93	60 49	68 06	75 62	151 24	226 86
34	54 46	62 24	70 02	78 80	157 60	236 40
	56 19	64 22	72 25	80 28	160 36	240 54
	57 84	66 10	74 37	82 63	165 26	247 89
35	59 55	68 05	76 56	85 07	170 14	255 21
	61 25	70 00	78 75	87 50	175 00	262 50
36	63 00	72 00	81 00	90 00	180 00	270 00

The Table on the other side, *Numb. 2.* is to shew how much in Length will make a solid Foot of any Tree, whose quarter-part of the Circumference is from 6 Inches to 36 Inches.

### E X A M P L E.

Suppose a Tree 60 Inches in Circumference, the fourth part of which is 15 Inches, or one Foot three Inches: which if you look for in the first Column, opposite to it in the second Column you will find 7 Inches and 6 Tenth parts of an Inch, (which is somewhat above half an Inch) and so much in Length will make one Foot Square.

---

*Numb. 2.*



Numb. 2.

Ft.	In.	Ft.	In.	Pts.
0	6	4	0	0
	7	2	11	2
	8	2	3	0
	9	1	9	3
	10	1	3	3
	11	1	2	3
I.	0	1	0	0
	1		10	2
	2		8	8
	3		7	6
	4		6	7
	5		5	9
	6		5	3
	7		4	8
	8		4	3
	9		3	9
	10		3	5
	11		3	3
II.	0		3	0
	1		2	8
	2		2	6
	3		2	3
	4		2	2
	5		2	1
	6		1	9
	7		1	8
	8		1	7
	9		1	6
	10		1	5
	11		1	4
III.			1	3

By the Table on the other side, suppose a Plank or Board 9 Inches broad, to find how much in length will make one Foot.

First find out 9 Inches in the first Column, opposite to it in the second Column you will find 140 which is one Foot four Inches, so much in length of a Plank or Board 9 Inches broad going to make up a Foot: So that every 16 Inches in length is a Foot of Plank; and consequently, every 8 Inches half a Foot, every 4 Inches a quarter, &c. Thus again, If a Board hold 2 Foot and 3 Inches in breadth, 5 Inches and 3 tenth parts of an Inch in length will make a square superficial Foot of Plank, &c.

Numb. 3.

A Table to measure Plank,  
Boards, &c.

Ft.	In.	Ft.	In.	Pt.
	1	12	0	0
	2	6	0	0
	3	4	0	0
	4	3	0	0
	5	2	4	8
	6	2	0	0
	7	1	8	6
	8	1	6	0
	9	1	4	0
	10	1	2	4
	11	1	1	1
I.	0	1	0	0
	1	0	11	8
	2	0	10	3
	3	0	9	6
	4	0	9	0
	5	0	8	5
	6	0	8	0
	7	0	7	6
	8	0	7	2
	9	0	6	8
	10	0	6	5
	11	0	6	2
II.	0	0	6	0
	1	0	5	8
	2	0	5	5
	3	0	5	3
	4	0	5	1
	5	0	5	0
	6	0	4	8
	7	0	4	7
	8	0	4	5
	9	0	4	4
	10	0	4	2
	11	0	4	1
III.	0	0	4	0

The Table of square Measure on the other side shews how much goes to make a solid Foot of any piece of Timber from an Inch to 30 Inches square.

E X A M P L E.

I would know how long a piece of Timber of 10 Inches square ought to be to contain a Foot of Timber? Look for 10 in the Left-hand Column, opposite to which you'll find 1 Foot 5 Inches and 2 Tenths of an Inch; which is the Length that makes a solid Foot.



Numb. 4. A Table of Square Measure.

Inches.	Ft.	In.	Pt.
1	144	●	●
2	36	0	0
3	16	0	0
4	9	0	0
5	5	9	1
6	4	0	0
7	2	11	2
8	2	3	0
9	1	9	3
10	1	5	2
11	1	2	2
12	1	0	0
13		10	2
14		8	8
15		7	6
16		6	7
17		5	9
18		5	3
19		4	7
20		4	3
21		3	9
22		3	5
23		3	2
24		3	0
25		2	7
26		2	5
27		2	3
28		2	2
29		2	0
30		1	9

The Table of Round Measure on the other side shews how much in length makes a solid Foot of Timber in any round piece whose Diameter is from one Inch to 30 Inches over.

### E X A M P L E.

I would know how much an exact round piece of Timber, containing but one Inch in Diameter, must be in length to make a solid Foot of Timber? Look in the first Column for one Inch, and opposite to it you will find 113 Foot 1 Inch and 7 Tenth parts of an Inch: which is the Contents sought for.

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*Numb. 51*

Numb. 5.

A Table of Round Measure.

Inches.	Ft.	In.	Pt.
1	113	1	7
2	28	3	4
3	12	6	8
4	7	0	8
5	4	6	3
6	3	1	7
7	2	3	7
8	1	9	2
9	1	4	7
10	1	1	5
11		11	2
12		9	4
13		8	4
14		6	9
15		6	0
16		5	3
17		4	6
18		4	1
19		3	7
20		3	3
21		3	1
22		2	8
23		2	5
24		2	3
25		2	1
26		2	0
27		1	8
28		1	7
29		1	6
30		1	5

If you have a mind to know the Value of a Tree standing, you may girt it, and allowing for the Bark, and so much as you think it will measure less in the girting-place than at the Butt, and taking of the height of it, compare it with the foregoing Tables, and you may the better guess at its Worth because you have a Rule to go by. Now for the taking of the height of a Tree, the best way is with a Quadrant, which the larger 'tis, the more exact you may be in doing of it; which is done after this manner: Hold your Quadrant so as that your Plummets may fall on 45 degrees, and go to such a distance from the Tree as you may, through the Sights of your Quadrant, see the top of it; and measure from the place of your standing to the foot of the Tree, adding to it the height of your Eye from the ground, and it will give you the height desired: Or if you stand where the Plummets may fall on 22 degrees and 30 minutes, it will be half the height; or 67 degrees and 30 minutes will be the height and half the height.

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### Chap. IX. *Of Grubbing up of Woods and Trees.*

**T**HE grubbing up of Woods and Trees may be needful upon the account of their Unthriftness, or to plant better Lands for that purpose, and to grub up Roots that are decayed to make room for them that are more thriving, &c. Which tho' a chargeable Work, yet it may much be lessened by a particular Engine, which I thought it might be of advantage to make more publick. It is a very cheap Instrument, only made use of in some particular Places, and will ease about a third part of the charge of this sort of Labour; it is an Iron-hook of about two foot four inches long,



long, with a large Iron Ring to it, the shape of which you have in the Figure, and may be made for about 3s. 6d. charge; which they use after this manner. Where a stub of Under-wood grows, they clear the Earth round it where they think any Side-roots come from it, and cut them; which when they have done, in any Hole on the sides of the Root they



enter the Point of the Hook, and putting a long Leaver into the Ring, two Men at the end of it go round till they wring the Root out, twisting the Tap-roots asunder, the Difficulty of coming at which occasions the greatest Labour of this Work. Stubs also of Trees may be taken up with it; in which Work it saves a great deal of Labour, tho' not so much as in the other, because the Stubs must be first cleft with Wedges before you can enter the Hook in the sides of it to wrench it out by pieces.

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### Chap. X. *Of Seasoning of Timber.*

**T**IMBER being felled and sawn, is next to be seasoned: for doing of which, some advise that it be laid up very dry in an airy place, yet out of the Wind or Sun; others say, it ought to be free from the extremities of the Sun, Wind, and Rain: and that it may not cleave, but dry equally, you may daub it over with Cow dung. Let it not stand upright, but lay it along, one piece upon another, interposing some short Blocks between them to preserve them from a certain Mouldiness which they usually contract when they

E e                      sweat,

sweat, and which frequently produces a kind of Fungus, especially if there be any sappy parts remaining.

Others advise to lay Boards, Planks, &c. in some Pool or running Stream; or, which is better, in Salt-Water for a few days, to extract the Sap from them, and afterwards to dry them in the Sun or Air; for by so doing (say they) they will neither chap, cast, nor cleave: Mr. *Evelyn*, particularly, commends this way of Seasoning of Firr, but against Shrinking there is no Remedy.

Some again commend Buryings in the Earth, others in Wheat; and there be Seasonings of the Fire, as for the scorching and hardning of Piles which are to stand either in the Water or the Earth.

Sir *Hugh Plat* informs us, that the *Venetians* use to burn and scorch their Timber in the flaming Fire, continually turning it round with an Engine till they have gotten upon it a hard black coally Crust; and the Secret carries with it great Probability, for that the Wood is brought by it to such a Hardness and Driness, that neither Earth nor Water can penetrate it. “ I my self (says Mr. *Evelyn*) “ remember to have seen Charcoal dug out of the “ Ground amongst the Ruins of ancient Buildings, “ which have in all probability lain covered with “ Earth above 1500 Years.

For Posts and the like that stand in the Ground, the burning the Outsides of those Ends that are to stand in the Ground, to a Coal, is a great Preservative of them. Sir *Hugh Platt* adds, “ That “ a *Kentish* Knight of his Acquaintance did use to “ burn (in this manner) the Ends of the Posts for “ Railing or Pailing: And this was likewise practised with good success by a *Suffex* Gentleman, *Walter Burrell* of *Cuckfield*, Esq;.

This burning of the Ends of Posts is practised in *Germany*, as appears by the Abstract of a Letter written

written by *David Von-der-beck* a German Philosopher and Physician at *Minden*, to Dr. *Langelott*, registred in the *Philosophical Transactions*, Numb. 92. Pag. 1585. in these Words: “Hence also they  
 “slightly burn the ends of Timber to be set in the  
 “Ground, that so by the Fusion made by Fire  
 “the Volatile Salts (which by accession of the  
 “Moisture of the Earth would easily be consumed  
 “to the Corruption of the Timber) may catch  
 “and fix one another.

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Chap. XI. *Of Preserving of Timber.*

**W**HEN Timber or Boards are well seasoned or dried in the Sun or Air, and fixed in their places, and what Labour you intend is bestowed upon them; the use of Linseed-oyl, Tar, or such oleaginous Matter, tends much to their Preservation and Duration. *Hesiod* prescribes to hang your Instruments in Smoak to make them strong and lasting: surely then the Oyl of Smoak (or the vegetable Oyl by some other means obtained) must needs be effectual in the Preservation of Timber also. *Virgil* advises the same.

The Practice of the *Hollanders* is worth our notice; who, for the Preservation of their Gates, Portcullis, Draw-bridges, Sluces, and other Timbers exposed to the perpetual Injuries of the Weather, coat them over with a mixture of Pitch and Tar, upon which they strew Cockle and other Shells, beaten almost to Powder, and mingled with Sea-sand, which incrusts and arms it after an incredible manner against all the Assaults of Wind and Weather.

When Timber is felled before the Sap is perfectly at rest (says Mr. *Evelyn*) it is very subject to the Worm: and to prevent and cure this in Timber,

I recommend the following Secret as most approved.

Let common yellow Sulphur be put into a Cucurbit-glass, upon which pour so much of the strongest Aqua-fortis as may cover it three Fingers deep. Distill this to Driness, which is done by two or three Rectifications: Let the Sulphur remaining at the bottom (being of a blackish or sad red colour) be laid on a Marble, or put into a Glass, where it will easily dissolve into Oyl. With this anoint what Timber is either infected with Worms, or to be preserved from them. It is a great and excellent *Arcanum* for tinging the Wood, of no unpleasant Colour, by no Art to be washed out, and such a Preservative of all manner of Woods nay of many other things also, as Ropes, Cables, Fishing-nets, Masts, or Ships, &c. that it defends them from Putrefaction either in Waters or above the Earth, in Snow, Ice, Air, Winter, or Summer, &c.

It were superfluous to describe the Process of making the Aqua fortis; it shall suffice to let you know, that our common Coperas makes this Aqua-fortis well enough for our purpose, being drawn over by a Retort: and for Sulphur, the Island of St. *Christophers* yields enough (which hardly needs any refining) to furnish the whole World. This Secret (for the curious) I thought not fit to omit, tho' a more compendious way may serve the turn. Three or four Anointings with Linseed-oil has proved very effectual. It was experimented in a Walnut-tree Table, where it destroyed Millions of Worms immediately, and is to be practised for Tables, Tubes, Mathematical Instruments, Boxes, Bedsteads, Chairs, &c. Oyl of Walnuts will doubtless do the same, and is a sweeter and better Varnish. But Oyl of Cedar, or that of Juniper, is commended above all.



Chap. XII. *Of closing Chops and Clefts in green Timber.*

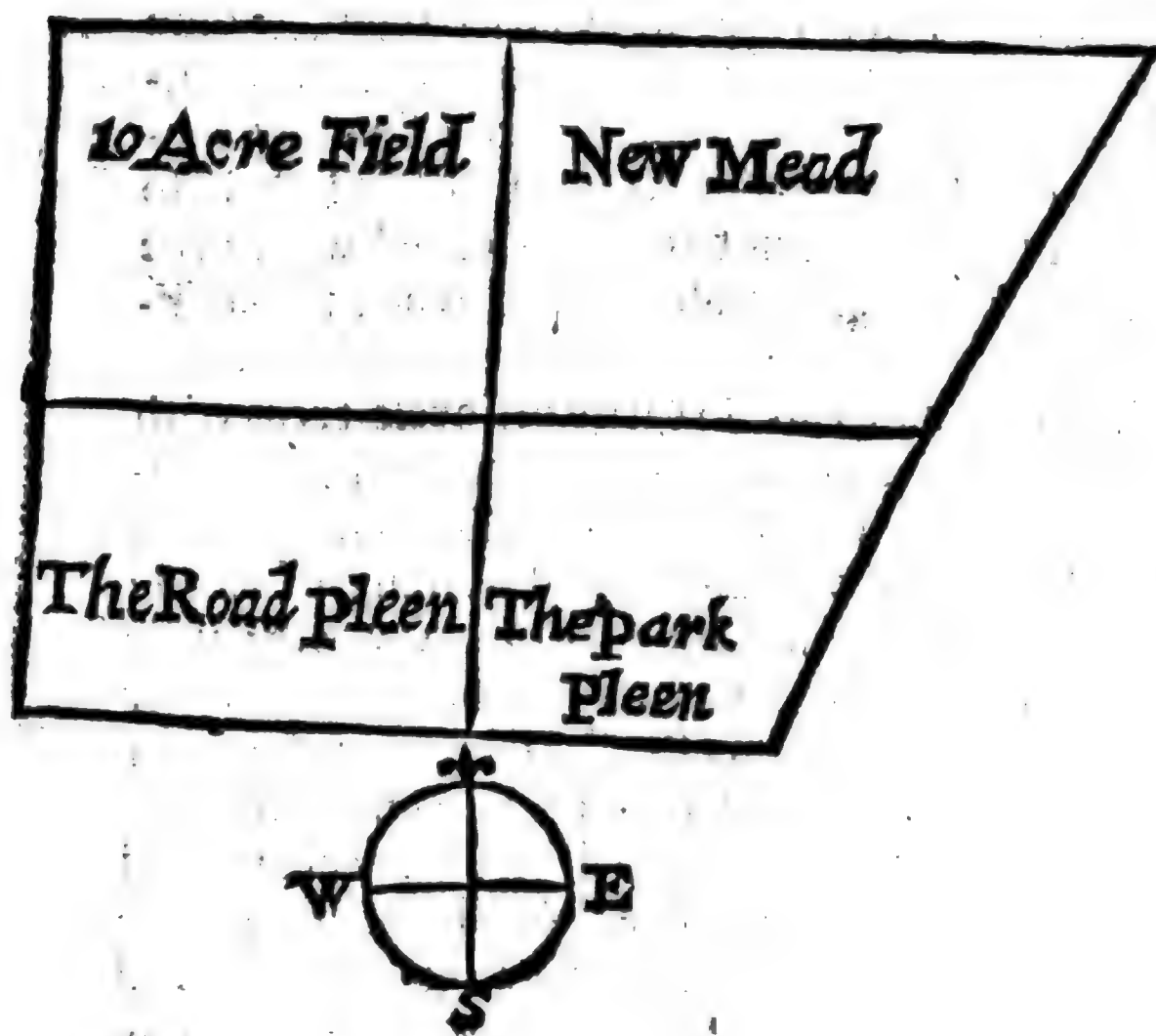
**G**REEN Timber is very apt to split and cleave after it is wrought into form, which in fine Buildings is a great Eye-sore: But to close the Chops and Clefts I find this Expedient to do well; which is to anoint and supple it with the Fat of Powder'd-Beef Broth, with which it must be well soaked, and the Chasm filled with Sponge dipped into it: this to be done twice over. Some Carpenters make use of Grease and Saw-dust mingled: But the first is so good a way (says my Author) that I have seen Wind-shock Timber so exquisitely closed, as not to be discerned where the Defects were. This must be used when the Timber is green.

I shall conclude this Treatise of Forest-trees with considering, and in some measure proposing of Remedies for two of the greatest Discouragements that belong to the Planting and Raising of them: the one is, the long time that the Owners are forced to wait for the Growth of their Timber before they can make any Profit of it; and the other is, the Timber's being liable to so many Abuses and Cheats from Tenants, Bailiffs, Executors, and others, in case of the Owner's Negligence or Death; especially if they are forced to leave their Wood to a young Heir. Now as to the first Objection, if the Timber is thriving there is no Stock you can have Money in that will turn to better account, tho' you stay long for it; nor any thing that it can be better secured in, which I think will make amends for the Stay. And as for the second Objection, which I think the most material, and the greatest Inconveniency and Discouragement to Planting and raising of Timber of any; if I can

E c 3

propose

propose a Method for the taking an exact account of the Timber-trees, both in Hedges and Woods, I shall wholly answer that Objection and Inconveniency too: for the doing of which, first, in Hedges you may observe this method. Suppose the four Fields underneath to be what you have a mind to take an account of, being called by the Names of *The 10 Acre Field*, *The New Mead*, *The Road Pleen*, and *Park Pleen*, and lying as in the following Map;



Make a Scheme after the following manner.

Names

Names of the Fields.	Side of the Fields.	Timber trees			Pollards.			Saplings, or young Trees.		
		Oak	Ash	Elm	Oak	Ash	Elm	Oak	Ash	Elm
10 Acre Field.	N. side	10	3	4	6	10	4	10	5	4
	E. end	5	4	6	3	6	3		2	3
	S. side		5	4		2		1	3	4
	W. end	4		3	8			6	5	4
New Mead.	N. side	5	3		2	6	3	4		
	E. end		3	4		0		5	4	2
	S. side	3	5	2	2	3	4	6	7	8
Park Pleen.	N. side				5	6		7	5	2
	E. end	4	3	2		0				
	S. side	3	4	2	3	2	2	5	5	6
	W. end		5	4	2	3	2	4	6	5
Road Pleen.	S. side	4	3	2		1	2			
	W. end				5	6	7	8	4	2

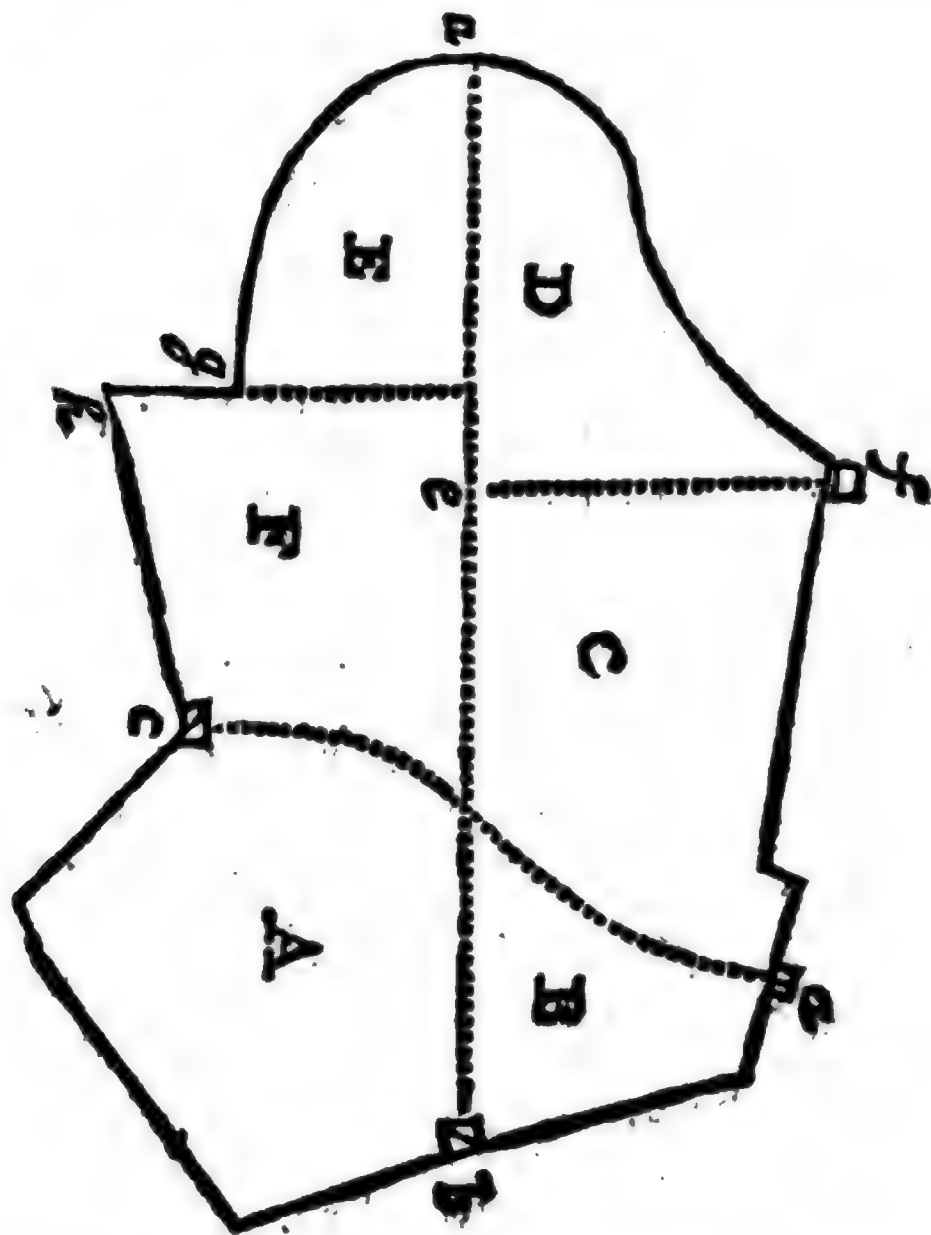
Note, That in the above Scheme, the first Column is the Names of the Fields, the second Column is the Sides and Ends of the said Fields, the third the number of Timber Oaks, the fourth the Timber Ash, the fifth the Timber Elms, the sixth Oak Pollards, the seventh Ash Pollards, the eighth Elm Pollards, the ninth Saplin or young Oaks, the tenth young Ash, the eleventh young Elms; and the twelfth Column is to add other sorts of Trees in, or to set down when any are felled.

Only 'tis to be observed, that to the *New Mead* Field is reckoned but two Sides and only the East End, because the Ditch being on the *New Mead* side, the Hedge-row between that and the *Ten Acre* Field is reckoned to the ten Acres; and tho' the Hedge-row between the *New-Mead* Field and the *Park Pleen* is reckoned to both, 'tis because there are Trees on the Dools belonging to the *Park Pleen*, and not what Trees are in the Hedge-rows.

E c 4

For

For the taking an Account of the Number of Trees in Woods, where they are long and narrow 'tis easily done when they are felled; but where Woods are large, 'tis more difficult: I shall therefore propose to you the Method I took for the doing of it in a Wood I have that contains about 40 Acres. A Draught of which you have as follows.



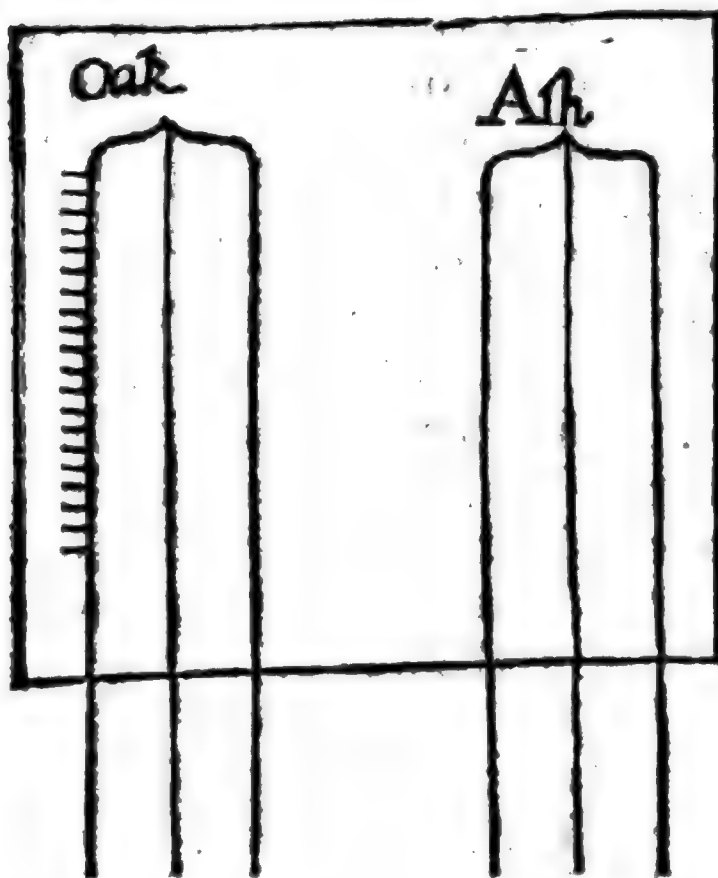
Which Wood being too large to fell at once (I not having Woods enough to answer such a Fall every Year) and finding my Wood cut in patches, and other parts of it scambled and cut before it was at its Growth; that they might come at what was fit to cut, I resolved to cut a Cart-way through the middle of it, by which means I proposed three Advantages; first, to cut what part of my Wood I would,



would, and to have a clear Cart-way to carry off both my Wood and Timber, which saved my Standers and Wood too very much; secondly, to divide my Wood into two Parts, in order to the counting of my Standards; and thirdly, it being near my House, to have a fine Walk of it; which Cart path in the Map is marked with a prick'd Line from *a* to *b*. But I suppose I shall be asked how, in a standing Wood, I could carry the Path so streight, and keep the middle of the Wood from one end to the other? For the doing of which, the Method I took was this: I drew on the Map the Line *ab*, and taking of the Angle on the Map at *a*, I set my plain Table to that Angle, and by my Sight I directed a Workman to cut a narrow Path, of about two Foot wide, and about seven or eight Yards into the standing Wood, and then I stuck up two Sticks of equal height, on the top of which I made a small Slit, and stuck a small piece of white Paper in them, and then ordered the Workman to go into the standing Wood as far as he could, through the Boughs, see the white Papers, and then to cut his way out to them; and this he repeated doing till he was so far off the first Stakes as not to discern them well, and then I set up another Stake in the same manner to range with the first, and continu'd adding of one Stake after another till he got through to the Wood's end: this is the way of their cutting their glades in *Hertsfordshire*, which hit as near the middle as you see it laid down in the Draught: this, as I said before, divided my Wood into two parts; and from the Gate at *c* to the Stile at *d* was a Foot-path, which I marked likewise with a prick'd Line, which made in the Wood the two Divisions of *A* and *B*. And having some Woods adjoining to this Wood at *f*, I was obliged to make another Cart-way from *e* to *f*, which made the Divisions of *C* and *D*: and from the Foot-path *c d*,  
being

being too large a Division, to lessen it I made several small Hills, in which I stuck Stakes to run parallel with the Corner of the Wood *g b*, which made the Divisions *E* and *F*. By which means I divided my Wood into six Parts, which afforded me a part to fell every Year, and gave me an opportunity of cutting the Trees in each Division as I felled them, which I did after this manner:

My Wood consisting only of Oak and Ash, I divided my Trees into three sorts, *viz.* first Storers, which I reckoned all to be that were under 12 Inches girt; secondly, Saplings, which I called all under 24 Inches girt; and what was two foot girt or above, a Yard from the Ground, I reckoned Timber-trees: and taking of a Slate, I drew



fix Lines after this manner; and taking of one with me with a Paper ruled after the same manner, and a piece of Chalk, a black Lead Pencil, and a Line with two Knots in it, one of 12 Inches long, and the other of 24 Inches; those Trees

that we were not certain of being under the Measure mentioned he measured, and as he counted the Trees he drew a Chalk-line about them, which shewed us which were told, that we might not tell them again: and as he told them I scored on the first Line the Oak Storers, on the second Line the Saplings,

Saplings, and on the third Line the Timber Oaks, observing the same Method with the Ash; and when I had scored twenty on any of the Lines, I rubbed out my Scores on the Slate, and with my Pencil I scored one on the Paper for one Score. And the Divisions of *A* and *B* being all the Wood that was felled at present, when I came home I found my Account of those two Divisions as follows, which I set down in the following method; that I think will be Direction enough for this or any other Woods that you shall have occasion to take an Account of.

*An Account of the Number of Trees in the several Divisions of my Wood called The Great Wood, taken in the Year 1705.*

N <sup>o</sup>	O A K S.			A S H.		
	Storers	Saplin	Timber	Storers	Saplin	Timber
A.	150	110	50	50	40	60
B.	50	60	55	115	45	40

And tho' this Exactness may seem more nice than is necessary, yet no one knowing whose hand he may fall into, it may be of advantage, the Pains being very little, especially since I have my self, with only one to help me, taken an Account of 3 Acres of Wood Land in an hours time where the Standards have been very thick, which I think no very tedious business; but I shall leave every one to do as they see most convenient, and proceed to give some account of the *Kitchin Garden*.

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## B O O K XIII.

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### Chap. I. *Of such Herbs, Roots and Fruits as are usually planted in the Kitchen Garden or Olitory.*

**I** Have already shewed the Husbandman how to order his Pasture, Arable and Wood Land; and what I have now to treat of, is the *Kitchen-Garden* and the *Orchard*, which are parts of Husbandry of no small advantage to the Industrious Farmer; and for the quantity of Ground that the *Kitchen-Garden* takes up, there is no part of his Land that will turn to better advantage than what is improved this way, it being a great deal of Meat and Corn that is saved by Beans, Pease and Roots; and likewise a great deal of Barly, where is plenty of Cyder, besides the advantage that Fruit brings by what may be sold to neighbouring Towns, and the Cyder that might come to be exported to Foreign Parts, if we would attain to a true perfection in the Art of making this profitable Liquor; but of these things hereafter. I shall at present only give directions for the *Kitchen Garden*; in first shewing what is the best Situation and Figure for a *Kitchen-Garden*: Secondly how to order the Ground-Beds, &c. for this use, that being the Foundation of the Work; and thirdly, give a Catalogue of such useful Herbs, Roots and Fruits (as are therein to be cultivated) in an Alphabetical manner; which I think will be the readiest way to find any particular sorts of Garden Commodities that shall be desired, and will be



be much better than the ranking of them under their several Kinds or Species. And therefore,

*First*, as to the Situation of the *Kitchin-Gardens*, Situation. small Valleys or low Grounds are best, because commonly such places have a good depth of Earth, and are fatned by the neighbouring Hills, especially if they are not exposed to Inundations, and afford good Water; but as for Fruit-Trees, a Ground moderately dry (provided the Soil be rich and deep) is the best; and for the Position, if the Earth be strong, and consequently cold, the *South* Aspect is the best; but if it be light and hot, the *East* is to be preferr'd. The *Southern* Aspects are often exposed to great Winds from the middle of *August* to the middle of *October*; the *Eastern* is subject to the *North-East* Winds, which withers the Leaves and new Shoots, especially of *Peach Trees*; and the *Western* to the *North West* Winds, which brings Blites in Spring, and strong Gales in *Autumn*, which commonly shakes off the Fruit before it is ripe: But as all Positions have their Perfections and Imperfections, care must be taken to make what advantage we can of the first, and to use our best skill to defend our selves from the last.

The best Figure for a *Kitchin Garden*, and most convenient for Culture, is a Square of straight Angles, being once and a half or twice as long as broad; for in Squares, the most uniform Beds may be made; the Walls ought also to be well furnished with Fruit-Trees, to be of a good height, and placed so as to afford good shelter on all sides; the Beds, Plats and Borders to be set with all sorts of things necessary for all Seasons of the Year, and to have the Walks clean, of a proportionable largeness, and to afford as much variety as the place will admit of.

*Secondly*,

Land to  
order.

*Secondly*, For the way of managing and ordering of Land for this purpose; as in all other sorts of Husbandry, so in this you are to consider the nature of the Soil, and what is most proper and best to make an addition to its goodness; of which Particulars I have treated already, only it is to be noted, that as your *Kitchen-Garden* is to afford great variety of Plants, Roots, Herbs, &c. your Soil must be made more rich than for Corn, most Garden things requiring a richer Soil, if you design to have them prosper well; if you meet with Ground that is naturally good and moist (which is the best for Garden-ground) it is a great advantage, and much lessens the Expence; but Land is very rarely found that doth not require a great deal of Labour, tho' it may not want Manure; for many times the Surface of the earth shall be good, which (being opened a Spit deep) will be found to afford only a cold Clay bottom; which is a much more pernicious Soil for Trees and Garden-ware than Gravel it self, because in Gravel, especially if any thing inclined to Springs, the Roots of Trees, &c. often meet with some small Veins, whence they draw nourishment; whereas the Clay, in dry Years especially, is so hard, that the Roots cannot penetrate it, and binds so firm, that it hinders the moisture that falls upon it from sinking through, and so causes the Roots to stand too moist in Winter, and scorches them with too much heat in the Summer.

To redress this defect, the only expedient is, to break up this sort of Land as deep and no deeper than the Earth is good, beginning with a Trench four or five Foot broad, the whole length or breadth of the place, casting the several Moulds all upon one side; and into your bottom, when your Trench is empty, cast in long Dung, or, which is much better, Fern, Leaves of Trees, rotten

ten Sticks, Weed, or any sort of Trash you can procure with the most ease and least charge, to rot and keep the Ground from binding.

This trash should be laid at the bottom about half a Foot thick, and after that sling upon it your top Spit, casting the Mould which lies uppermost (and which is ever best) upon the Dung, and so making the second Trench as the former, you should fill your first Trench so as that the Mould which you found undermost should now lie on the top; and thus you must continue to do till you have finish'd the whole work.

But it may be here objected, that the Earth which you take from beneath will be barren and unfruitful, which indeed it will for the first Year, but being exposed to the Air, Rains and Frost of one Winter, it will be so mellow as to make it fruitful, especially if any thing of Dung be added to it; but if it prove any thing churlish, an addition of drift Sand will quickly loose the binding quality of it; and if it is cold Land, Smiths Ashes, or other Ashes, if you live near Towns where they are to be had, will be the best manure for it; Pigeons, Fowls and Sheeps-dung are also very good for all sorts of cold Land.

The best time for the trenching up of Land is the beginning of Winter, when the Ground is moist and easie to dig; but as there are two Seasons of the Year to sow and plant Herbs, so there are two times to bring Gardens into order, which is the *Autumn* and the *Spring*; the first Labour being to be bestowed about the beginning of *November*, upon such Ground as you design to sow in the Spring, and to dig in the Month of *May* such Ground as you design for an Autumnal Sowing, that the cold in Winter and the heat in Summer, may have an opportunity to make the Clods short

Time of  
Trenching.



short and brittle, to turn them into Dust, and to kill the unprofitable Weeds.

But where you meet with a gravelly bottom, you should husband it as is already prescrib'd, and the Stones which are mingled with the Earth should be carry'd out; but in case the Gravel lie not very thick, and that when it is broke up, you meet with Sand or small loose Gravel, it may do without flinging it out of the Trenches, because the Trees, by help of the Dung, will strike Root in it.

And tho' these are chargeable ways of ordering of Gardens, yet it is done once for all, and the Charge will be abundantly answered in the growth of what Plants you set in it, especially for Fruit or other Trees that root downwards; but some are more curious, in that they Skreen all the Earth with which they fill their Trenches; but that is needless for the whole Garden, particular Beds on which you design to raise particular Seeds or Plants being sufficient to be so ordered.

*Of Manure.*

Besides which, you must have an equal Composition or mixture of Dung and Earth alway ready in some Corner of your Garden to be laid by, that it may be thoroughly rotten and turned to good Mould against Spring, to renew the Earth with about your Artichoaks, and for the planting and sowing of Colliflowers, Cabbages, Onions, &c. *vid.* the culture of *Orchards*.

*Laying out  
of Beds.*

And for each sort of Seed and Plants it will be necessary to lay out particular Beds, which may be the more or less in number, according to the variety of Seeds you have to sow, and Herbs to plant, and which ought not to be wider than you can reach crosse; that you may, by Paths left between them, come to weed them, and rake them fine; which is the best way of sowing Seeds, &c.

The



The surest way to have the most advantage of <sup>Seeds so sown</sup> your Dung or Soil, and to have Seeds prosper, that they may come up most even, and be all buried at one certain depth, is thus; First rake your Bed even, then throw on a part of your mixture of Earth and Dung; which also rake very even and level, on which sow your Seeds, whether Onions, Leeks, Lettice, or such like; then with a wide Sieve sift on the Earth mixed with Dung about a quarter of an Inch thick, or a little more; and you shall not fail of a fruitful Crop.

If your *Garden* be exposed to the cold Winds, <sup>Shelter.</sup> which are very injurious to most sorts of Plants: Next unto Trees, Pales, Walls, Hedges, &c. the best shelter is to lay your Ground after this following manner, that is, Let it be laid up in ridges a Foot or two in height, somewhat upright on the back or North-side thereof, and more sloping to the South-side for about three or four Foot broad, on which side you may sow any of your Garden Tillage; these Banks lying one behind the other will much break the Winds, and these shelving sides will much expedite the ripening of Pease and other Fruits, by receiving more directly the Beams of the Sun; in case the Ground be over-moist you may plant the higher, and if over-dry then the lower; so that it seems to remedy all extreams except heat, which rarely injures.

To make a hot Bed, in *February* or earlier, for <sup>Hot Bed.</sup> the raising of *Melons, Cucumbers, Radishes, Colliflowers*, or any other tender Plants or Flowers; you must provide a warm place, defended from all Winds by being inclosed with a Pale or Hedge made of Reed or Straw about six or seven Foot high, of such distance or capacity as your occasion requires, within which you must raise a Bed of about two or three Foot high, and three Foot over of new Horse-dung of about six or eight <sup>days</sup>

days old, treading it down very hard on the top, make it level; and if you will you may edge it round with Boards or Bricks, laying of fine rich Mould about three or four Inches thick on it; and when the extream heat of the Bed is over, which you may perceive by thrusting in your Finger, then plant your Seeds-as you think fit, and erect some Forks four or five Inches above the Bed, to support a Frame made of Sticks and covered with Straw or bass-matt to defend the Seeds and Plants from cold and wet; only you may open your covering in a warm day for an hour before Noon and an hour after. Remember to earth up your Plants as they shoot in height, and when they are able to bear the cold you may transplant them, and the Dung of your hot Beds, when done with, will be of great use to mend your Garden.

*Watering.*

Many curious and necessary Plants would suffer were they not carefully watered at their first removal, or in extream dry seasons, therefore this is not to be neglected early in the Spring; but whilst the weather is cold be cautious of watering the Leaves of the young and tender Plants, and only wet the Earth about them.

When your Plants or Seeds are more hardy and the Nights yet cold, water in the Forenoons; but when the Nights are warm and the Days hot, then the Evening is the best time.

If you draw any Water out of Wells or deep Pits, it ought to stand a Day in the Sun in some Tub or such like, for your tender Plants in the Spring, before you use it.

But Pond, River or Rain-water needs it not, and is to be preferr'd before Well or Spring-water.

If you infuse Pigeons-dung, Sheeps-dung, Hens-dung, Ashes, Lime, or any fat Soil or other matter

ter

ter in your Water, either in Pits, Cisterns or other Vessels for that purpose, and therewith cautiously water your Plants, it will much add to their encrease.

For *Colliflowers*, *Artichokes*, and such like, let the Ground sink a little round the Plant in form of a shallow Dish, and the Water will the better and more evenly go to the Roots.

Water not any Plants overmuch, lest the Water carry away with it the vegetative or fertil Salt, and so impoverish the Ground and chill the Plant.

But it is better to water a Plant seldom and thoroughly, than often and slenderly; for shallow watering is but a delusion to the Plant, and provokes it to Root shallower than otherwise it would, and so makes it more obnoxious to the extremity of the weather.

If you are willing to have the Ground always moist about a Plant, place near it a Vessel of Water, putting therein a piece of Wollen Cloth or Lift, and let the one end thereof hang out of the Vessel to the Ground, and the other end be in the Water in the manner of a Crane, causing the Lift or Cloth to be first wet; and by this means will the Water continually drop till all be drop'd out of the Vessel, which may then be renewed, only you must observe to let the end that hangs without the Vessel be always lower than the Water in the Vessel, else it will not succeed; and if it drop not fast enough, encrease your Lift or Cloth; if too fast, diminish it.

If the Weather be never so dry when you sow any sorts of Seeds, water them not till they have been in the Ground 48 Hours, and the Ground settled about them, that they may be a little glutted with the natural juice of the Earth, first, lest they burst by too much water coming on them

them at once. These general Rules being observed, I shall *thirdly* proceed to the Alphabetical Order promised; and begin with

# A.

## *Alesander.*

**A** *Lesander* is propagated only by Seed that is oval and pretty big, and a little more swelling on one side than the other, which bends a little Inwards, streak'd all along and cross-ways on the Edges between the sides. It's one of the Furnitures of our Winter Salads, which must be whitened in the same manner as *Wild Endive* or *Succory* at the end of *Autumn*, its Leaves being cut down, and the Bed wherein it grows covered over with long dry Dung or Straw, skreened so close that the Frost may be excluded from it, whereby the new Leaves that spring therefrom will grow white, yellowish and tender. It's sown pretty thin in the Spring, and the Seed gathered the latter end of Summer, and the Plant being hardy requires not much watering.

## *Arrach.*

*Arrach*, *Orrach* or *Orage*, is propagated only by Seed, being one of the quickest Plants both in coming up and running to Seed, which last it doth the beginning of *June*. They sow it pretty thin, and some of it, which is good Seed, should be transplanted to a separate Place. Its leaves are very good in Pottage and Stuffings. It should be used as soon as it peeps out of the Ground, because it decays quickly; and to have some the more early, they sow it in hot Beds. It thrives  
very



very well in all sorts of Ground, but grows fairest in the best.

*Asparagus.*

*Asparagus* is a fine Plant for the Kitchen, and was much esteemed even in *Pliny's* time: They are raised of Seeds sown the latter end of *March*, which some sow in the Shell as they grow, that is, four or six Seeds together; but the best way is to break the Shell and to beat out the Seed: They must be sown indifferent thin, and about a Year after, if they are big enough, as they will be if the Ground is good and well order'd; if not, at two Years end at least you may transplant them; which is to be done at the end of *March* and all *April*, planting them in Beds about three or four Foot Broad, and raised somewhat higher than the Path-ways that go between them. These Beds must be well prepared by digging first about two Foot deep, and four Foot wide, and made level at the bottom; mix very good rotten Dung with the Mould, and fill them up. They are planted at two Foot distance in three or four Rows. You must forbear to cut them for three Years, that the Plants may be strong and not stubbed, for otherwise they will be small; but if they be spared four or five Years, they will grow as big as Leeks; the small ones may be left, that the Roots may grow bigger, suffering those that spring up about the end of the season to run up into Seed, and by this means it will exceedingly repair the hurt that you have done to the Plants in reaping their Shoots. When you have, upon the Winter's approach, cut away the Stalks, the Beds, about the beginning of *November*, must be covered with new Horse-dung four or five Fingers thick; but some use Earth four Fingers thick, and

two Fingers thick of old Dung, which will keep them from the Frost: The Beds are to be uncovered about the middle of *March*, and good fat Mould about two or three Fingers thick spread over them, and the Dung laid in the Allies or elsewhere to rot and be fit to renew the Mould with the following Spring.

If the old Roots of these Plants be taken up about the beginning of *January*, and planted in a hot Bed well defended from the Frost, *Asparagus* may be had at *Candlemas*; when you cut them, remove some of the Earth from about them, lest the others that are ready to peep be wounded, and let them be cut as low as conveniently may be.

The Beds for this Plant must be covered every Year with a little Earth taken off from the Pathway, because they, instead of sinking, are always raising by little and little; and every two Years they are to be moderately dunged: About *Michaelmas* the Stems must be cut down, and the fairest taken for Seed; and to make them come to bear, an Iron Fork (the Spade being dangerous) is to be used to draw them out of the Nursery Bed. And you must not fail every Year, at the latter end of *March* or beginning of *April*, to bestow a Small dressing or stirring of the Ground about three or four Inches deep on every Bed (taking care not to let the Spade go too deep, so as to hurt the Plants and to render the Superficies of the Earth loose) the better to dispose it to drink up the Rain and *May-dew*, which nourishes the Stocks, and facilitates the Passage of the *Asparagus*, and kills the Weeds. The worst Enemies to this Plant are a sort of Flea that fastens upon its Shoots and makes it miscarry; against which mischief there has been yet no remedy found out; if they are planted in good Ground, they may stand 10 or 12 Years.

*Artichoke.*

*Artichok*

Is by some esteemed one of the most excellent Fruits of the *Kitchen-Garden*, and recommended, as upon other accounts, so for that its Fruit continues in season a long time. They delight in a rich deep Soil, and not very dry. The Ground for them must be very well prepared and mixed several times with good Dung, and that very deep. The Slips that grow by the sides of the old Stumps taken from them at the time of their dressing in the Spring serve for Plants, which are to be set in *April*, and kept watered till they are firmly rooted. And these, if they be strong, will bear Heads the *Autumn* following; which Offsets, to be good, should be white about the Heel, and have some little Roots to them. Sometimes *Artichoks* are multiply'd by the Seed which grows in the *Artichok* bottom, when they are suffered to grow old to flower and to grow dry about *Midsummer*.

For the Planting of them they commonly make little Trenches or Pits about half a Foot deep, which they fill with Mould, placing the Roots of them by a Line chequerways. If the Soil be rich, the distance must be three or four Foot, but if not then nearer. All their other culture till Winter is only weeding and a little watering if the Spring be dry; but upon the approach of the Winter, for their security against Frost, be sure to cut the Leaf within a foot of the Ground, and raise Earth about them in the form of a Mole-hill within two or three Inches of the top, and then cover it with long Dung, which secures them also against the Rain: but others put long Dung about the Plant, leaving a little hole in the middle, and this does very well. An Earthern Pan with a hole at the

top is used by some; a Bee-hive is better; but the most usual way is to cut their Leaves about *November*, and to cover them all over with Earth, and to let them lie in that manner till the Spring; but if this be done too soon it may rot them when they come to be uncovered, and therefore it must be done regularly, at three several times, at about four days interval, lest being yet tender the cold Air spoil them. Take off all the old Slips, and leave not above three of the oldest to each Foot for the Bearers, and a supply of good fat Mould must be given to the Roots as deep as conveniently may be. The whole Plantation of them should be removed in five Years, tho' they will last much longer in a good deep Mould.

In order to have Fruit in *Autumn*, it is necessary the Stem of such as have born Fruit in the Spring should be cut off to prevent a second Shoot, and these lusty Stocks will not fail of bearing very fair Heads, provided they be dressed well and watered in their necessity, and the Slips that grow on the sides of the Plants (which drain all their Substance) taken away.

The Stalk is blanched in *Autumn*, and the Pith eaten raw or boiled: The way of preserving them fresh all Winter, is by separating the Bottoms from the Leaves, and after parboiling, allow to every Bottom a small earthen glaz'd Pot, burying it all over in fresh melted Butter, as they do Wild Fowl, &c. They are also preserved by stringing them on Pack-thread, a clean Paper being put between every Bottom to hinder them from touching one another, and so hung up in a dry place: They are likewise pickled.

*Chards* of *Artichokes*, otherwise called *Custons*, are the Leaves of fair *Artichokes*, ty'd and wrapp'd up in Straw in Autumn and Winter, being covered all over but at the top; which Straw makes them



them wax white, and thereby lose a little of their bitterness, so that when boiled they are served up like true *Spanish Cardons*, but yet not so good; besides, the Plants of them rot and perish during the time of whitning them.

For *Artichocks* you have not only the hard weather and excess of wet to fear, but they have the Field-Mice for their Enemies, which by gnawing of their Roots spoil them.

There are three sorts of *Artichocks*, the *White* ones, which are the most early; the *Violet* ones, whose Fruit is almost of a pyramidical figure, being the hardiest sort; and the *Red* ones, which are round and flat like the white ones; the two last are esteemed the Best.

## B.

### *Balm.*

**B**alm is an odoriferous Herb, being multiply'd both by Seed and rooted Branches like *Lavender*, *Hyssop*, *Thyme*, &c. The tender Leaves are used with other Herbs for Salads; the Sprigs fresh gathered put into Wine or other Drink during the heat of Summer, give it quickness; and besides, this Plant yields an incomparable Wine made in the same manner as *Comflip*, &c.

### *Barberries.*

*Barberries* are raised by Suckers, of which you have plenty about the Roots of old Trees, tho' 'tis not good to suffer too many Suckers to grow about them; neither let their tops be cut like close round Boshes, as many do, which makes them grow thick, that they can neither bear nor ripen Fruit so well as if they grew higher and thinner. It

It is a Plant that bears a Fruit very useful in Housewifery, whereof there are several sorts, altho' but only one common one; that which beareth its Fruit without Stones is counted best; there is moreover another sort which chiefly differs from the common kind, in that the Berries are twice as big, and more excellent to preserve.

### *Basil.*

*Basil* is of several sorts, as that which bears the biggest Leaves, especially if they are of a Violet Colour; but that which bears the least Leaves is most curious, and that which bears the middling ones is the most common sort; all which are propagated by Seed of a black Cinnamon colour, very small and a little oval, and by Slips. It is annual and very tender, being seldom sown but in hot Beds, beginning therewith at the beginning of *February*, and continuing so to do all the whole Year. Its tender Leaves are used in a small quantity with the furniture of Salads, among which they make an agreeable Perfume, the same being likewise used in Ragou's, especially when dry. To make it run to Seed (which is gathered in *August*) its usually transplanted in *May*, either in Pots or Beds. This Plant imparts a grateful Savour, if not too strong: It is somewhat offensive to the Eyes, and therefore the tender tops are to be very sparingly used.

### *Beans.*

*Beans* are of great use and benefit, of which there are several sorts, viz. the great *Garden-Bean*, the middle sort of *Bean*, and the small *Bean* or *Horse-bean*, &c. the last sort of which I have treated of already. As for *Garden-beans*, they are usually

usually set betwixt *November* and *February*, at the Wain of the Moon. But if it happen to freeze hard after they are sired, it will go near to kill them, therefore the surest way is to stay till after *Candlemas*. It is a general Error to set them promiscuously, for being planted in Rows by a Line, at three Foot distance it is evident they bear much better, and may be easier weeded, topped or gathered. If they be sowed or planted in the Spring they must be steeped two or three Days in Water, and it's best to set them with Sticks.

In gathering *green Beans* for the Table, it is the best way to cut them off with a Knife and not to strip them; and after gathering, the Stalks may be cut off near the Ground, and so probably a second Crop may rise before the approach of the Winter.

### *Beet Raves or Beet Radishes.*

*Red Beet* produces Roots for Salads, being multiplied only by Seeds of about the bigness of a middling *Pease*, and round but rough in their roundness; they are sowed in *March*, either in Beds or Borders, very thin, in good well prepared Ground, or else they will not grow so fair and large as they should be; they are best that have the reddest Substance, and the reddest Tops, and are not good to spend but in Winter, their Seed is gathered in *August* and *September*, for the procuring whereof, some of the last years Roots that have been preserved from the Frost are transplanted in *March*, the Roots being cut into thin Slices and boiled, when cold, make a grateful Winter Salad.

### *Beet White.*

*White Beet* is also propagated for *Chards* by Seeds only, like unto that of the *Red Beets*, but of a duller

duller Colour; the Rib of it being boiled melts and eats like Marrow.

### *Chards of Beet*

Are Plants of *White Beet* transplanted in a well prepared Bed at a full foot's distance, producing great Tops, which in the midst thereof have a large, white, thick downy and cotton-like main Shoot, which is the true *Chard* used in Pottages and Entre-messes. When *White Beets* have been sown in hot Beds, or in naked Earth in *March*, that which is yellowest is transplanted into Beds purposely prepared, and being well watered in the Summer they grow big and strong enough to resist the hard Winter's cold, if so be they be covered with long dry Dung, as we do *Artichokes*. In *April* they are uncovered, and the Earth dressed carefully about them, and so produced; their Seed is gathered in *July* or *August*.

### *Borage*

Is propagated only by Seed that is black and of a long oval figure, commonly with a little white end towards the Base or Bottom that is quite separated from the rest, being streaked black all along from one end to the other. It grows and is to be ordered in the same manner as *Arach*, but it does not come up so vigorously. It is sown several times in one Summer; the Seed falls as soon as ever they begin to ripen, and therefore must carefully be watch'd, and the Stalks cut and laid a-drying in the Sun, whereby few will be lost: Its Flowers serve to adorn Salads, but they are not easily digested, tho' the Leaves are, if their String is first taken away.

*Bugloss* is ordered after the same manner.

*Bucks-horne*



*Bucks-horne Salad*

Is only multiply'd by Seed, which is very small, and is ordered after the same manner as *Borage*. When the Leaves of this Plant are cut, there springs up new ones in the room of them.

*Burnet.*

*Burnet* is propagated only by Seed that is pretty big, a little oval with four sides, and as it were all over engraven in the Spaces between the four Sides. It is a very common Salad, seldom sown, but in the Spring it often springs afresh, after cutting; the Shoots are for Salads; the same requires watering in Summer, at the end whereof the Seeds are gathered.

## C.

*Cabbage and Coleworts.*

**C**ABBAGE and Coleworts, whereof there are divers sorts, such as the *Dutch Cabbage*, which is very sweet and soon ripe; the *large-sided Cabbage*, that is, a tender Plant not sown till *May*, planted out in *July*, and eaten in *Autumn*; but the best Cabbage is the *White Cabbage*, which is the biggest of all; the *Red Cabbage*, which is small and low; the *perfumed Cabbage*, so named from its scent; the *Savoy Cabbage*, which is one of the best sort and very hardy; and the *Russia Cabbage*, which is the least and most humble of them, but very pleasant Food and quick of growth.

They are raised of the Seed sown between *Midsummer* and *Michaelmas*, that they may gain strength

strength to defend themselves against the violence of the Winter, which yet they can hardly do in some Years; or else they may be raised in a hot-Bed in Spring, and transplanted in *April* or about that time, and that into a very rich and well stirred Mould, if large *Cabbages* are expected. They delight most in a warm and light Soil, and require daily watering till they are rooted. But yet great quantities of ordinary *Cabbage* may be raised in any ordinary Ground if well digged and wrought.

As for the Seed, if you intend to preserve it, it must be of the best *Cabbages*, placed low in the Ground during the Winter, to keep them from cold Winds and great Frosts; they must have Earth Pots or a warm Soil over them for their covering, and be planted forth at Spring.

If your *Cabbages* or *Colliflowers* are troubled with Catterpillars, mix Salt with Water, and water them therewith, and it will kill them.

### *Chamemel.*

*Chamemel* double is like the common sort, only the Leaves greener and larger, as are the Flowers, and very double, being white and somewhat yellow in the middle. It is more tender than the common one, and must yearly be renewed by setting of Slips thereof in the Spring, or parting of the Roots.

### *Carduus Thistle.*

*Carduus*, tho' it is a noisome Weed, yet some of them are received into Gardens, whereof are first the greater *Globe-Thistle* with Leaves cut in, and are gashed in the middle full of sharp Prickles, its branched Stalk above a Yard high, bearing great round hard Heads with a sharp bearded Husk  
of

of a bluish green colour, from whence come pale blue Flowers spreading over the whole Head, and are succeeded by the Seeds contained in the Husks, which must be preserved, for the Plant dies in the Winter: Secondly, the *lesser Globe-Thistle*, whose leaves are smaller and whiter, as are the Stalk and Head of the Flowers, the Roots more durable, lasting four Years bearing Flowers.

Their flowering time is usually in *August*, and being sowed of Seeds, they will come to bear Flowers in the second Year; they prove a great annoyance to some Lands by killing the Grass, Corn, &c. tho' they be a sure token of the strength of the Ground. The way to destroy them, is to cut them up by the Roots before Seeding-time. Our *Ladies milky dappled Thistle* is worth esteem, for the young Stalk, about *May*, being peeled and soaked in Water, to extract the Bitterness, either boil'd or raw, is a very wholesome Salad eaten with Oil, Salt and Pepper; some eat them sodden in proper Broth, or baked in Pies like the *Artichoke*, but the tender Stalk boil'd or fry'd some prefer; both are nourishing and restorative.

### *Carrots.*

*Carrots* are the most universal and necessary Root this Country affords, and hereof there are two sorts, the Yellow, and the Orange or more Red; the last of which is by much the better. They are raised of Seed, and principally delight in a warm light or sandy Soil; and if the Ground be so, tho' but indifferently fertile, yet they will thrive therein. It's a usual thing to sow them with Beans in the intervals between them and in digged not ploughed Lands, because of their rooting downwards; for after the *Beans* are gone they become a second Crop; and some of the fairest  
of

of them being laid up in reasonable dry Sand, will keep throughout the Winter: The same may be reserved till Spring and planted for Seed, or else Seed may be gathered from the biggest aspiring branches. They may be sowed in *Autumn* or Spring.

*Cardon Spanish.*

*Cardons Spanish* are only propagated by Seed that is of a longish Oval form, and about the bigness of a Wheat Corn, of a greenish Olive colour, streaked from the one end to the other. They are sown at two several times; the first from the middle of *April* to the end, and the other time about the latter end of *May*, in a good and well prepared Ground, in small Trenches or Pits a Foot wide and six Inches deep filled with Mould, and then make for them Beds four or five Foot wide, in order to place in them two Ranks of those Pits chequerways, putting five or six Seeds into every hole, with intention to let but two or three grow, and take away the rest if they come up: But if in fifteen or twenty days the Seed doth not come up, they should be uncovered, to see whether they be rotten or begin to sprout, that their places may be supply'd with new ones if need require; they must be carefully watered; and towards the end of *October*, if you have a mind to whiten them, take the advantage of a dry day, first to tie up all the Leaves with two or three Bands, and some days after to cover them quite with Straw or dry Litter well twisted about them, except at the top, which is to be left open; thus ordered they whiten in about three Weeks, and are fit to eat.

They may be transplanted upon the approach of Winter into the green House, removing some Earth with them, some of which may be planted next Spring to run to Seed in *June* or *July*.

*Chervil.*



*Chervil.*

*Chervil* is only multiply'd by Seed that is black, very small, pretty longish, striped longways, and grows upon Plants sown the *Autumn* before, which knits and ripens in *June*; the musked sort thereof is one of our Salad Furnitures; and at the beginning of Spring while the Leaves are tender is very agreeable. It remains many Years without being spoiled by the Frost. As for the ordinary ones for Salads it is annual, and a little thereof should be sown monthly, as there is occasion for it. It runs very easily to Seed, and if you would have some of it betimes, it must be sown by the end of *Autumn*; the Stalks are cut down as soon as they begin to grow yellow, and the Seed beaten out, as is done by that of other Plants.

*Citruls, Pumpions or Pumpkins,*

Are propagated only by Seeds of a flat and oval figure, partly large and whitish, and as it were neatly edged about the sides; there are two sorts of them, the Green and the Whitish; they are usually sown in hot-Beds about the middle of *March* and beginning of *April*; and being taken up with the Earth about them, are transplanted into holes two Foot Diameter, and one deep, and at two Fathoms distance, which are filled with Mould; in *June* when their *Vines* begin to grow five or six Foot long, some Shovelfulls of Earth are thrown upon them to prevent their being broken with the Wind, and to make them take Root at the place so covered, whereby the Fruit that grows beyond that part will be better nourished, and so grow bigger: if the weather is dry, they should be well watered.

*Cives.*

*English Cives* are multiplied only by Off-sets that grow round about their Tufts; from them a part is taken to replant, being split out and separated into many little ones, and transplanted nine or ten Inches asunder, either in Borders or Beds in pretty good Ground: they will last three or four Years without removing, or any other Culture than weeding and watering sometimes during the heat: it is their Leaves only that are used for one of the Sallet furniture.

*Cibouls* : See *Scallions*.

*Clary.*

*Clary*, when tender, is an Herb not to be rejected in Sallets. It's raised of the Seed.

*Cole-Flower or Cauly-Flower.*

*Cole* or *Cauly-Flower* is an excellent Plant, whose Seed is sown in *August*, and ought carefully to be preserved over the Winter, by Matts or other close shelter; or else they may be raised in hot-Beds in the Spring, by sowing of the Seeds in *February*, and when they have indifferent large Leaves may be removed into good Lands, prepared for that end; tho' the best way is to dig small pits and fill them with rich light Mould, wherein the *Cole-Flower* must be planted, and afterwards carefully watered. Those that are of one Years growth usually Flower about a time; to prevent which, some of the Plants may be removed once a Fortnight, for two, three or four times as a Man pleases, and so they may be had successively one after another; or else the  
Flower

Flower may be cut off before it is fully ripe with a long Stalk, and set in the Ground as far as may be, and it will retard its ripening; but it must be shaded, and have a little watering lest it wither.

### *Convul-Lily.*

*Convul-Lily*, *May Lily*, or *Lily of the Valley*, has a strong Root that runs into the Ground, and comes up in divers places with three or four long and broad Leaves, and from them rises a naked Stalk with white Flowers at the top like Bottles with open Mouths of a comfortable sweet Scent. There is another sort differing from these only in Flowers, which are of a fine pale Red, both of them flowering in *May*, and bearing best in a shady mean Soil, being easily propagated from Plants.

### *Corn-Sallet.*

*Corn-Sallet* is an Herb whose top-Leaves are a Sallet of themselves, seasonably eaten all the whole Winter and early in the Spring with other Sallets; it's raised of Seed at first, but afterwards will Sow it self. *Vid. Maches.*

### *Cresses.*

*Cresses-Garden*, *Indian* or *yellow Lark-Spurs*. They are sown in many Gardens for culinary Uses; and the latter from a Flower, are now become excellent Sallets as well the Leaf as the Blossom; for early Sallets they are raised in hot-Beds: but if sown in *April* they will grow very well on ordinary Garden-ground, and their Leaves and Blossoms plentifully encrease. *Water-Cresses* are eaten boiled of

raw, and like the other sort of *Cresses* are raised of Seed.

### *Cucumbers.*

*Cucumbers* are of two sorts, the large green *Cucumbers*, vulgarly called the *Horse-Cucumber*, and the small White which is the more prickly *Cucumber*. The first are best for the Table green out of the Garden; but the other to preserve. They are planted and propagated after the same manner as *Melons*, only they require more watering, and are withall much more hardy; but tho' the watering makes them more fruitful, yet they are more pleasant and wholesome if they have but little water.

### *Currants.*

*Currants* or *Corinths* first took their Names from their likeness to the small *Grape* or *Raisins* which come from *Corinth*. They are raised by Suckers or Cuttings stuck in moist places, of which you may have plenty about the Roots of old Trees, which when they have grown for some Years, suffer not many Suckers to grow about them. Do not cut the tops to a round close Bush, as many Gardeners do; whereby they grow so thick, that they neither bear nor ripen their Fruit so well as if they grew taller and thinner. The *English* red *Currant* (formerly transplanted to *England*) is not now valued, nor yet the black: the white *Currant* till of late was most in esteem, but the red *Dutch Currant* becoming Native of our Soil, has been so much improved in moist rich Grounds, that it hath obtained the higher Name: besides which, there is again another sort (propagated among us) to be esteemed only for Curiosity, not for Fruit. Their Culture consists in cutting away the old Wood, and preserving only that of one or two Years



Years growth; for a confused mixture is not only disagreeable and pernicious, but the old Branches will bear nothing but very small Fruit, till at last they quite degenerate; therefore when the Stocks grow old, you should raise a Plantation of new ones in some other fresh choice piece of Ground, after they have stood about seven or eight Years.

*Currants* and *Goose-berries* may be inoculated on their own kind.

## D.

### *Dandelion.*

**D**ANDELION is an Herb which is macerated in several waters to extract the bitterness. It is little inferiour to *Succory*, *Endive*, &c. The *French* Country People eat the Roots of it.

## E.

### *Endive white or Succory.*

**E**NDIVE or *Succory* is of several sorts, as the white, the green and the curled, which are only propagated by Seed that is longish, of a white grey colour, flat at one end, and roundish at the other: it grows upon the Stocks or Stems of the preceding Years growth, and you would take it but only for little bits of Herbs cut small. The wild is also propagated in the same manner, from longish black Seed; and is a sort of a very good annual Plant used in Sallet and Pottage in Autumn and Winter Seasons, if so be it is well whitened, and so made tender. All sorts of them agree pretty well with any kind of Ground, and are seldom

begun to be Sown till the middle of *May*, and then very thin, or they must be thinned afterwards, in order to be whitened in the place where they first grew, without transplanting; there is also but a little quantity of them to be sown at once, because they are apt to run into Seed: but for a greater quantity let them be sown the latter end of *June*, and all *July*, in order to have some good to spend in *September*; after this a great quantity is sown in *August*, for a sufficient supply to serve the Autumn and fore-part of the Winter. When they are transplanted in Summer time, they must be set at a large Foot distance, and great Beds of five or six Foot broad are usually made for them, to plant them in afterwards in Lines marked out with a Cord; this Plant requires great and frequent waterings, and when big enough to be whitened, it is tied up with two or three Bands according as its height requires, and it is whitened in fifteen or twenty Days: but to preserve it upon the approach of cold, it must be covered with long dry Dung, whether it be tied up or not. At the end of *September* the Stocks are planted pretty near one another, because it neither grows so high or spreads so much as in Summer: and in case any Plants can be saved in Winter, they must be transplanted again in the Spring, in order to produce Seed, that they may have a sufficient time to ripen. For the wild *Endive* it is sown in *March* pretty thick in a well prepared Ground, and fortified by watering and cropping, that it may be fit to whiten in Winter; the best way to whiten which, is to interpose some Props from side to side to keep the Dung, where-with it must be well covered, from touching of it. It will shoot under a close cover, and therefore care must be taken to stop up well the passages on all sides, that no Light or Air at all can get in; for hereby the Roots are much cleaner, and relish not

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so much of the Dung. It may be transplanted into Conservatories in Winter. When it is green it endures the Frost well enough, and runs into Seed the latter end of *May*. Many People eat its Shoots in Sallets when they are young and tender: it is eaten with *Mint*, *Rocket*, *Tarragon*, and other hot Herbs.

*Eschalotts.*

*Eschalotts* are now from *France* become an *English* Plant, being increased and managed after the same manner as *Garlick*, which may be seen for that purpose; only they are to be set earlier, because they spring sooner, and taken up as soon as the Leaves begin to wither; long after which, they must not lie in the Ground, for either they rot there, or the Winter kills them: they give a fine relish to most Sauces, and the Breath of those that eat them is not offensive to others; but being planted two or three Years in the same Ground they are apt to degenerate,

F.

*Fenil.*

**F**ENIL is only propagated by Seed that is small, longish, oval and streaked with greenish grey streaks, it is one of our Sallet-furniture, that is seldom transplanted, and resists the cold of the Winter if it is sowed in Beds or Borders; it springs again when it is cut, and its youngest and tenderest shoots are the best: the Seed is gathered in *August*, and agrees well enough with any sort of Ground.

*French-Beans, or Kidney-Beans.*

*French* or *Kidney-Beans* are a sort of Codware that are very pleasant, wholesome Food, being but lately brought in use amongst us, and are not yet sufficiently known: there are four Sorts thereof. *First*, The Scarlet-Bean which has a red Husk, and is not the best to eat in the Shell, as *Kidney-Beans* are usually eaten, but is reputed the best to be eaten in Winter when dry and boiled. *Secondly*, The painted or streaked Beans which are the hardiest, tho' meanest of all. *Thirdly*, The large white Bean which yields a fair delicate Pod. *Fourthly*, The small white Bean which saving in size is like the latter, but esteemed the sweeter. They delight in a warm, light and fertil Ground, which being about the beginning of *May* or very soon after planted with them at a Foot distance, and two Fingers deep, will yield an extraordinary Crop: you may either set up tall Sticks near for them to twine about, or let them lie on the Ground; but if you are straitned in room, those on Sticks will yield the greatest increase.

## G.

*Garlick.*

**G**ARLICK is increased by parting of the cloves or Off-sets in *February* or *March*, and planting of them in a rich good Soil, on which they will encrease wonderfully. Their Leaves about the end of *June*, may be tied in knots, which will prevent their spindling, and keeping down of the Leaves will make the Roots large: Much more of this Root would be spent for its wholesomeness,



ness, were it not for the offensive Smell it gives to the By-standers, which is taken away by eating of a Beet-root roasted in the Embers; but yet by *Spaniards* and *Italians* and the more Southern People, it is familiarly eaten with almost every thing, and esteemed of singular Vertue to help Concoction.

*Gooseberries.*

*Gooseberries* must be ordered the same way as before is prescribed for *Currants*. They are of six sorts, as white, green, yellow, red, black and striped.

H.

*Harts-horn: See Bucks-horn.*

*Hyfop.*

*Hyfop* or *Hyssope* is propagated only by Slips.

I.

*Jack by the Hedge.*

**J**ACK by the Hedge (*Alliaria*, or *Sauce alone*) is an Herb that grows wild under Banks and Hedges, and has many Medicinal Properties, being eaten as other Sallets are, especially by Country People, and is much used in Broth.

*Jerusalem Artichok, See Potatoes.*

*Kidney.*

## K.

*Kidney-Beans, See French-Beans.*

## L.

*Lavender.*

**L**AVENDER is multiplied by Seed, and old Stocks or Plants transplanted, but chiefly by slips, it serves to garnish Borders of the Kitchen-Gardens, and yields a Flower which is used for several Physical uses, and to put among Linen to perfume it.

*Leeks.*

*Leeks* are raised of Seed, as *Onions* are, and sown about the same time : about the Month of *August* plant them in very fat rich Ground, for which deep holes are made with a Setting Stick, but fill not the holes with Earth; water them once in two days with Water; enriched with fat Dung, and they will be very large and white : the best for Seed are planted in the same manner as *Onions*; and the Seed-bearing Stalks of both must be supported by Threads or Sticks, otherwise they will lean to the Ground.

*Lettice.*

*Lettices* of all sorts are multiplied only by Seed, which being sown in the Spring, seed in *July*; and so do the Winter or Shell-*Lettices*, after having passed the Winter in the places where they were re-planted

planted in *October*; they are the most common and useful Plant in the Kitchen-Garden, especially for Sallets. There are many kinds of them: as the *Cabbage-Lettice*, which with the ordinary Culture comes to perfection: the *Shell-Lettice*, so called from the roundness of its Leaf, almost like a Shell, is the first that will Cabbage at the going out of the Winter; otherwise called *Winter-Lettice*, because they can pretty well endure ordinary Frosts. They are sown in *September*, and in *October*, and *November*, transplanted into some Wall-border towards the South and East; or else they are sown in hot-Beds under Bells in *February* or *March*, and are good in *April* and *May*. Another sort of *Lettices*, called *Passion-Lettices*, prosper well in light Ground, and are succeeded by the bright curled *Lettices*, which usually Cabbage in the Spring, and do also well upon hot-Beds: of this sort there are two others, *viz.* *George-Lettices* that are thicker and less curled; and the *Minion* which is the least sort, and requires good black or sandy Ground. Near about the same Season comes in curled green *Lettices*, besides the red and short *Lettices* that have small heads, and require the same Ground. In *June* and *July* come on the Royal Bell-gards, or Fair Looks, Bright *Genoas*, *Capuchins*, &c. to whom frequent Rains are pernicious: others are called Imperial *Lettices* from their size, delicate in Taste, but apt to run into Seed. But to have no more diversities, the great inconveniencies that befall *Cabbage-Lettices* are, that they often degenerate so far as to Cabbage no more, and therefore no Seed should be gathered but from such as do Cabbage well, and as soon as they are Cabbaged they must be spent, unless you would have them run unto Seed without doing any Service: for if the rot that begins at the end of their Leaves seizes them, which it will often do when the Ground or

Season

Season is not favourable unto them, there is hardly any remedy; only the Ground that is faulty may be mended with small Dung, whether it be sandy or cold gross Earth.

Those *Lettices* which grow biggest should be placed at ten or twelve Inches distance, and for those that bear Heads of a middling size, seven or eight will do; and such as would be good *Husbands* may sow *Radishes* in their *Lettice-beds*, for they will be all drawn out and spent before the *Lettice-Cabbage*; and for the same reason, *Endives* being much longer before they come to perfection than the *Lettices*, some of these last may be planted among the *Endives*. You may also blanch the largest *Roman Lettices*, when they are at their full growth, by binding of them up with Straw or raw Hemp, or by covering of them with Earthen pots, that have dung put about them.

### *Lily.*

Of this plant there are divers kinds. *First*, The *Fiery-red Lily* that bears many fair Flowers on an high Stalk of a fiery red at the top, but towards the bottom declining to an Orange colour with small black Specks. *Secondly*, The *Double-red Lily* having Orange coloured single Flowers with little brown Specks on the sides, and sometimes but one fair double Flower. *Thirdly*, The *Yellow Lily* which is the most esteemed of any, being of a fine Gold colour. *Fourthly*, The common White one like the common Red. *Fifthly*, The *White Lily of Constantinople*, smaller every way than the last, but bears a great many more Flowers. *Sixthly*, The *Double-white Lily* in all things like the common, except the Flowers which are constantly double, seldom opening at all but in a fair Season. *Seventhly*, The *Persian Lily* rooted like the Crown Imperial,



Imperial, beset with whitish green Leaves to the middle, and thence to the top, with many small Flowers hanging their Heads of a dead purple colour, with a Pointil or Chives in the middle, tipt with yellow Pendants. These (save the last which Flowers in *May*,) put forth their Flowers in *June*. All of them are increased by the Roots, which hold their Fibres, and therefore like not often removing but when there is Occasion. The best time is when the Stalks are dried down, for then the Roots have the fewest Fibres, and ought to be set five Inches deep in the Earth, and uncovered to the bottom every Year, that without stirring the Fibres of the old Roots, the young ones may be parted from them, and they only remain with new rich Earth put to them and covered; which will much advantage the fairness and number of their Flowers. See *Conval-Lily*.

## M.

### *Maches.*

**M**ACHES or *Masketts* are multiplied only by Seed, which is very small, and of an Orange colour, they being a sort of little Sallet, which is termed wild or rustical. Beds are made for them, which are sowed about the end of *August*, they are hardy enough to resist the rigour of Frosts; and forasmuch as they produce a great many little Seeds that will easily fall, they will sufficiently propagate themselves without any other Culture than only weeding.

### *Marjoram.*

Of *Marjoram* there are several sorts which are easily raised of Seed, sown in *May*; the vulgar

gar fort and *Pot Marjoram* is raised by Slips, whose uses are commonly known: There is also a distinction of *Winter-Marjoram* which is the best, and *Summer-Marjoram* that lasts only that Season: it is also propagated by Slips or Suckers in *April*.

### *Melons.*

*Melons* or *Musk-melons*, as they are usually called from their pleasant scent, are a Fruit raised for pleasure in the Summer time, and distinguished by several Names: those the most usually known are the large ribbed *Melon*, and the small round *Melon*, the Seeds being first steeped in Milk for twenty four Hours. They are sown in *February* at the Full of the Moon, setting two or three in a hole about an Inch deep in a hot Bed, as is directed before.

Towards the end of *April* the *Melon*-Plants are to be removed out of the hot Bed, into the Beds where they are to grow all Summer, which Beds, or at least some large holes in them, are to be filled with rich light Mould, only you must be carefull to prevent both the Roots and Plants touching of the Dung, and to water them moderately, and that only when the Earth is very dry and hot; which repeat the doing of in such weather about two or three times in a Week. If too much rain fall, they should be covered, because either too much wet or too much drought is prejudicial to them; the best time for removing of them is in an Evening after a fair day, when they must be watered and defended from the Sun and Cold, for three or four days together. They may be covered when grown large with Glass Bells or square Cases of Glass made on purpose, which must be kept close at Night with some admission of

of Air under the Glass, or at the top in the Day time; the Leaves must not be wet in watering, and a Tile may be placed under each *Melon* that it may lie the warmer upon it, and the small Shoots that do extract the Sap of the most leading Branches must be nipt off, taking care to leave not above three or four of the most vigorous Branches whose knots grow nearest to one another. When your Fruit is grown as big as a Tennis-ball, nip off the Shoot at some distance beyond them, and they will grow large, provided you suffer not above two upon each foot, choosing such as are nearest the principal Stem, the rest being of little value.

They are known to be ripe when the Stalk seems as if it would part from the Fruit, when they begin to gild and grow yellow underneath, and by the fragrant Odour they yield, which encreases more as they ripen; but if they be to be carried far, it is necessary they be gathered when they begin to ripen; before they be eaten, they must be put into a Bucket of cold water, which will make them eat cool and pleasant.

The Seeds of the most early ripe ought to be preserved, and those Seeds that lodged on the Sunny side of the *Melon*, are to be preferred before the rest.

### *Mint.*

*Mint* is multiplied by Runners, that are as so many Arms that spring out of its Tuft and take Root, but chiefly by Slips. There are divers sorts, whereof the Garden *Mint* is the best.

It must be removed every three Years, and placed always in good Earth, at about a Foot distance: some thick Tufts of it are likewise planted in hot Beds in Winter.

### *Mustard.*

*Mustard.*

*Mustard* is of a hot and dry Nature, is raised of Seed, and will grow in any sort of dry Soil.

## N.

*Nasturces.*

**N**ASTURCES, commonly called *Capuchin Capers*, are multiplied only by the Seed. The Leaf of it is pretty large, and the Flower of an Orange colour; the figure of the Seed is a little pyramidal, divided by Ribs, having all its Superficies engraven and wrought all over, being of a grey colour inclining to a light Cinnamon. They are sown in hot Beds about the end of *March*, or the beginning of *April*, and afterwards are replanted by some Wall. The Seed easily falls as soon as ripe, as does that of *Borage*, and therefore they must be carefully gathered.

## O.

*Onions.*

**O**NIONS are sown the latter end of *February* or beginning of *March*, and are of two sorts, the red and the white, being rais'd of Seeds; the white is esteemed the best, whose Roots are much in request for the several uses they are put to in the Kitchen; they delight in a fine fat and warm Mould, and are to be sown in *March* or soon after; but if sooner, they must be at first covered. They do not extend their Fibres far downwards,



wards, and therefore at the time of sowing, the Bed is to be trod and beat flat, and the Seed as equally dispersed as may be. When they spring you are to sift some fine Earth a Finger thick almost over them, and if when they begin to appear they are trod down, the Roots will grow the larger: They have prospered exceeding well when sown with Bay-salt, and are usually ripe in *August*, when they are to be taken up and dried in the Sun, and reserved in a dry place for Use. But they may be sown all the Year for the use of young *Onions* or *Scallions*; such as are sown in *Autumn*, must be covered with Straw or Pease-hawm, and being preserved all Winter, they will be early *Cibouls* or *Scallions* in the Spring. The best *Onions* are such as are brought out of *Spain*, whence they of *St. Omers* had them, some of which have weighed eight Pounds, chuse therefore the large round white and thin skinned ones.

## P.

*Parsley.*

**P**ARSLEY, of all Garden Herbs, is the most universally used in the Kitchen, it being an excellent Ingredient in most Pottages, Sauces and Sallets. There is the common and curled sort multiplied only by Seed, that is small and of a greenish grey colour, and a little bending inward on one side, and all over streaked from one end to the other. It must be sown in the Spring pretty thick, and in good and well prepared Ground; its Leaves when cut shoot out new ones like Sorrel; it can bear any moderate but no violent cold; and therefore it is best to bestow some covering on it to defend it: In order to its producing

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small

small Roots, it must be thinned in Beds or Borders where it is sown, and in hot Weather it requires pretty much watering. Its Seeds are gathered in *August* and *September*.

*Stone Parsley* is ordered the same way as *Alexanders*.

### *Parsnips.*

This is an excellent sweet Root, and must be sown in the Spring in a rich mellow and well ordered Soil, whose tops when they are grown to any bigness should be trod down, whereby the Roots will be made to grow the bigger; when you have raised them towards Winter, they may be disposed of in Sand, to be preserved in the same manner as *Carrots*, *Turneps*, &c. and the fairest may be kept for Seed, or else the fairest and oldest of the tops of those Seeds may be taken in Summer and sown, whereby the fairest Roots may be attained unto.

### *Pease.*

*Pease* is the chiefest of *Pulse*, whereof there is almost a different kind for every sort of Land and every Season; in a stiff fertil Ground they yield a considerable Crop, without such frequent fallowings as other Grain requires, in that they destroy the Weeds, and fit the Land for after Crops, being an Improver and not an Impoverisher of Land. Of such as are planted or sown in Gardens the *Hot-spur* is the speediest of any in growth, for being sown about the middle of *May*, it will in about six Weeks return dry into your hands again; or if sown in *February* or *March*, they will spring earlier than any sort sown before Winter. But if you sow them in *September*, and  
can

can by Fences of Reed, or otherwise defend them from extream Frosts, you may have ripe *Peasecods*, in *May* following; but the best way is to sow them so as to have them successively one after another. The next is the *Sugar Pease*, which being planted in *April* is ripe about *Midsummer*, its Cods are very crooked and ill shaped, being boiled with the unripe *Pease* in them, is extraordinary sweet; the great inconveniency that attends them is, that their extraordinary sweetness makes them liable to be devoured by Birds. The large white and green *Hasting* are tender, and not to be set till the cold is over, and then not very thick, for they spread much and mount high, and therefore require the help of tall Sticks; Besides which, there is another very large grey and extraordinary sweet *Pease* that is but lately propagated, and deserves a large Bed in your Kitchen-Garden.

They delight in a warm and light Soil; if it be rich, the *Pease* are the fairer; but if lean, they are the more early and spend better, especially when dry; some sow them at a random as they do Corn, but that is not a good way; others set them in Ranges with a Dibble or setting Stick at a convenient distance, which is a very excellent way both for the saving of the *Pease*, and to give liberty to pass between them for the hoeing, gathering, &c. But that which is most used and best approved of, is the hoeing of them in, which makes a quick riddance of the work, and covers all at a certain depth, and does not harden nor fadden the Ground as setting doth. If the Ground between them be kept bare, they will ripen the sooner by the reflection of the Sun; and if you can furnish them with Sticks to climb on they will yield a great increase.

As for Salleting, the Pod of the *Sugar Pease* when first it begins to appear with the Husk and Tendrells, affords a pretty acid Composition of Sallet, as do those of the *Hops* and *Vine*.

### *Pease Everlasting.*

*Pease-Everlasting* are Plants easily propagated, and in good Land thrive exceedingly. Their Roots yield yearly a great burden of excellent Provender for Horses. They must be sown early in the Spring on digged Ground in rows, and so hoed in the intervals between the Seed; for the Seed is long in coming up, and affords no profit the first Year. They require care and pains to preserve them from Weeds, but the succeeding Years will recompence you abundantly: some sow them first on a small Bed, and next Year remove them into Ground new dressed with Plough or Spade, and plant them about twelve or eighteen Inches asunder, whereby they may be easily weeded or hoed.

### *Penny-Royal.*

*Penny-Royal* is of three or four sorts. 'Tis a common Plant in every Kitchen-Garden propagated from Slips or Branches set in *April*.

### *Peony.*

*Peony* is a Plant of two Sexes, Male and Female; the first being single and known by its Leaves coming constantly whole without any division, its Root being long and round, and the Flower of a purplish red; the Females many times bearing single, others double, the Leaves of all being divided on the edges, the Roots more tuberous grow-



growing in clods, with many round pieces fastned to them with smaller strings. Of the best double ones there are several sorts: as *First*, The *Double purple Peony* smaller in all its parts than the common red ones, the Leaves of a whiter Green, and those of the Flower of a bright shining Colour. *Secondly*, The *Double Carnation Peony*, of a bright shining *Carnation* Colour at the First opening, but daily waxing paler till almost white; the Leaves never fall off but wither on the Stalk. *Thirdly*, The *Double Blush or white Peony*, large flowered, and at first opening tinctur'd with a light Blush, but in a few days turns perfect white, and continues so long before it decays, and then withers on the Stalk, which is the best yet come to our knowledge. *Fourthly*, The *Double striped Peony*, that is smaller than the last in all its parts, the Flower of a fine red, striped with white, lasts long, and falls no Leaf.

All these Flower in *May*, are hardy Plants and endure long in the Ground without stirring. *October* is the only time to remove them; and of those Roots none will grow but such as have Sprouts or Buds at the end, or rather top of them, of which sort each piece thereof will grow, the double ones some Years, bring Seeds to perfection, which being sown very thin in *September*, where they may stand unremoved in the Ground for two Years may produce new varieties.

*Pimpernell*: See *Burnet*.

*Pumpions*: See *Citrulls*.

*Potatoes*.

*Potatoes* are planted in several parts of our Country to a very good advantage, being easily encreased

fed by cutting the Roots into several pieces, each piece growing as well as the whole Root. A good fat rich Mould is best for them; but they will grow indifferently in any, provided 'tis well dunged: the Root is very near the Nature of the *Jerusalem Artichoke*, but not so good or wholesome. These are planted either of the Roots or Seeds, and may probably be propagated in great quantities, and prove good Food for Swine.

### *Purslain.*

*Purslain* is of two sorts, the Green and the Red or the Golden, and is raised only by Seed; to have a good Crop of which, the Plants should be replanted by the end of *May*, and set a Foot distance one from another: It is a Sallet Herb propagated with some difficulty, being tender in the Spring, and the Frosts usually nipping of it: but to have it early, it may be sown on a hot Bed, or in *April* on any rich Soil finely drest; when the Seeds are sown, clap over the Bed with the back of the Spade, and water it, for it delights in moisture. If it be sown thin, or transplanted apart, it will yield fair Plants either for Seed to pickle or to boil; as soon as the Seeds look very black, the Stalks must be gathered and laid abroad in the Sun, (which will the better mature the Seed) lay them on a Board or Cloth to preserve them from scattering or spilling. House them in the Night, and expose them again in the Day time till they are ripe. Some have affirmed that the Seed of three or Four Years old is better than new.

*Raspberries.*

## R.

*Rasberries.*

**R**ASBERRIES are of three sorts, the common wild One, the large red Garden *Raspberry*, which is one of the pleasantest of Fruits, and the white, which is little inferior to the red. They are propagated only by Slips that sprout out of their Stocks every Year in the Spring time, and are fit to replant the next Spring after. All of them begin to ripen about the beginning of *July*. They are planted in *March* either in Beds or Borders, observing the distance of two Foot between Plant and Plant. They shoot out during the Summer many well rooted Suckers, some of which you may take away to make new Plantations, by which means the old ones are likewise renewed, for they are dry as soon as their Fruit is gathered, therefore let not the tops be cut to a round Bush, whereby they grow so thick that they will neither bear nor ripen their Fruits so well as if they grew taller and thinner, the only Culture used to them is first in the Month of *March*, to shorten all their new Shoots which grow round about the Stock, and which ought only to be thickest and handsomest; and secondly, to pluck away all the small ones, as likewise the old ones that are dead.

*Radishes.*

*Radishes* are multiplied by Seed, that is round, somewhat thick, and of a Cinnamon Colour, growing in little kind of Cods. It is a very good Garden Root, of which there are three sorts; the small eating one which is raised of Seeds on a hot

H h 4

Bed

Bed (to have 'em early) with a sufficient thickness of good rich light Mould, that they may have depth enough to Root in before they reach the Dung, and in order to have large and clean ones, make holes as deep as your Finger about three Inches distance, into each of which a sound Seed or two is to be dropped and a little covered, leaving the rest of the hole open, whereby they will grow to the height of the hole before they dilate their Leaves, and yield a long transparent Root. But such of them as are sown after *Midsummer*, will not run to Seed that Year. The Second is the *Horse-Radish*, which is encreased by Plants or pieces of the Roots planted out, and by many made use of as an excellent wholesome Sauce. And note, that if you dig up any of the Roots for use, that you leave to the upper part that joyns to the Leaves about an Inch in length of the Root to plant again, which will grow and increase; only if 'tis dry Weather it will do well to water it, and to abate some of the Leaves in Proportion to your having lessened the Root. The last is the black *Radish*, which is so mean a Root as to find no place in a good Garden.

The best Seed for *Radishes*, is that which produces few Leaves and a long red Root. The time of its ripening and gathering is the end of *July*, when all the Stems are cut down, and when they have been dried some days in the Sun, the Seed is beat out and winnow'd. The Stocks that run to Seed shoot their Branches so high, that it is good to pluck them off to a reasonable height, that the first Stocks may be better nourish'd. The first *Radishes* that are eaten grow in hot Beds, and by that means some of them may be had during the Months of *February*, *March* and *April*. And in order to be supplied all the other Months, some must be sown among all manner of Seeds, they  
coming



coming up so very quickly, that there is time to gather them before they can do harm to the other Plants. The bigger Roots (so much desired) should be such as being transparent, eat short and quick without stringiness and not too biting.

*Rampion.*

*Rampion* is a Plant whose tender Roots are eaten in the Spring, like those of Radishes, but much more nourishing.

*Reponces.*

*Reponces*, or wild *Radishes*, are propagated only by Seed, being a sort of little wild ones that are eaten in Sallets, and grow without any pains in the Fields.

*Rocamboles* : See *Shallots*.

*Rocamboles* are a sort of mild *Garlick*, otherwise called *Spanish Garlick*, which is multiplied both by Cloves and Seed, which latter is about the bigness of ordinary Pease.

*Rocket.*

*Rocket*, being one of the Sallet furniture, is multiplied by Seed which is extream small, and of a Cinnamon or dark tanned Colour; it's sown in the Spring, the Leaf being pretty like that of *Radishes*.

*Rosemary.*

*Rosemary* is small, but a very odoriferous Shrub, that is propagated by Seed, or Branches that have

have some share of Root, or by Slips. The principal use whereof is to perfume Chambers, and in Decoctions for Washing, being multiplied much like Rue, and other Border Plants, it lasts several Years. And being planted upon dry Ground, hardly any Frost injures it. There are several sorts of it, as the broad-leaved, which is bigger than the common, and the gilded, and variously striped with yellow as if gilt, the Silver denominated from its Silver coloured Leaves, and the double flowered *Rosemary* that has stiffer Stalks, bigger Leaves, and many pale blue double Flowers.

### *Rose-Tree.*

*Rose-Tree* is of divers kinds, and one of the chiefest Ornaments of our *English* Garden, but it's more particularly distinguished into four kinds. First, The Red, whereof there are several sorts, as the *English Red Rose*, only observe that the Flowers of some are of a far deeper Red than others. The *Rose of the World*, which differs not from the former but in the colour of its Leaves, which are of a pale *Blush* colour, directly spotted thro' every Leaf of the double Flower of the same red colour which is in the *Rose*, and is the most beautiful of any. The *Hungarian Rose* whose shoots are green, and Flowers of a paler red Colour, as are those of the *Red Provence Rose*, whose Branches and Leaves are bigger and greener than those of the common *Red Rose*; the *Red Belgick Rose* that is much taller than the common dwarf *Red* or *Gilliflower Rose*, which grows lower than the ordinary *Rose*, whose Flowers are of a pleasant *Carnation* colour. The *Double Velvet Rose* that hath young shoots of a sad reddish green Colour, with few or no Thorns thereon, it seldom bears any store of *Roses*. The *Marbled Rose*, much like the last in growth, but its

its Leaves are larger, of a light red Colour marbled and vein'd. The *Rose* without Thorns, that has green and smother Shoots and Leaves than the Marble one, without any Thorns at all, and the Flowers of a pale red, spreading their Leaves. The *Frankford Rose*, that hath strong reddish Shoots full of Thorns, thick Flowers, and the Button under the *Rose* bigger than ordinary. Secondly, The *Damask* or pale coloured *Rose*, whereof the common *Damask Rose* is the ancient Inhabitant of *England*, and well known without describing. The *Parti coloured Damask Rose*, *York* and *Lancaster*, only differing from the other in its parted and marked Flowers. The *Crystal Rose*, like the last, only the Marks of the Flowers are much fairer and better than those of the other. The *Elegant variegated Danish Rose* has shorter and reddish shoots than the former, Leaves smaller, and Flowers something double. The *Damask Provence Rose*, whose Shoots and Leaves are longer than any of the rest, and of a reddish green with very large Roses. The *Monthly Rose* bearing Flowers only three Months in *England*, viz. *June*, *August* and *September*. The *Blush Belgick Rose* that hath larger Branches, and is fuller of Thorns than any of the former, the Flowers growing very thick, sweet-scented, and the Water distilled therefrom is almost as good as that of the *Damask*. Thirdly, The *Yellow Rose*, whereof the *single Yellow Rose* grows as high as the *Damask*, and whose young Shoots are full of small hairy Prickles of dark red Leaves, small, and Flowers single, and pale yellow. The *Scarlet Rose* of *Austria*, like unto the other, only the inside of the Leaves of the Flowers is a fine Scarlet, and the outside of a pale Brimstone Colour. The *Double yellow Rose*, whose Shoots are small, and not so red as those of the single kind, the Flowers contain very many small pale yellow Leaves with a great Thrum

Thrum in the Middle. *Fourthly*, The *White Roses* whereof the common one is well known; but there are two sorts thereof, the one being much doubler and fairer than the other. The *Blush Rose* that differs in nothing from the other, but in the Colour of the Flowers, that at first opening are of a fine pleasant Blush Colour, and then grow somewhat white. The *Double Musk Rose* that rises high with many green Branches, and dark green shining Leaves armed with great sharp Thorns, the Flowers come forth together in a Tuft not very double; but there is another of the kind that beareth single *Roses*, the scent of both Flowers is sweet like Musk. The *Damask Rose* or the *white Cinnamon Rose* grows not so high as the last, but the Leaves are larger and of a whiter green, and the Flowers bigger, whiter and more double, but not quite so sweet. The *Double Dog Rose*, that is in Leaves and Branches like the lesser *White Rose*. The *Ever-green Rose*, that grows like wild *Eglantine*, whose Leaves fall not away in Winter, as those of other *Roses*, from whence it took its Name; and Flowers containing but five Leaves of a pure white Colour, stand four or five together at the end of the Branches. The *Spanish Musk Rose*, that hath great green Branches and bigger green Leaves than the last, and single Flowers. The great *Apple Rose*, that hath a great Stock and reddish Branches with green sharp Thorns and single small Flowers standing on prickly Buttons. The *Double Eglantine*, whose Flowers are double made up of two or three rows of Leaves of a pretty red Colour.

But of all these varieties of *Roses*, the best and most esteemed amongst the Red, are those called the *Rose of the World*, the *Red Belgick*, the *Red Marble*, the *Rose without Thorns*, and the *Red Provence Rose*. Among the *Damask* are the *Crystal Rose*, the *Elegant variegated Danish Rose*, the *Blush Belgick*,



*pick, the Monthly and the Damask Provence Rose. The Scarlet Austrian, and Double Yellow among the Yellow Roses; and of the White Roses, the Blush and Damask Musk Rose.*

Now *Roses* are increased either by inoculating the Bud of them in other Shoots, or by laying down the Branches in the Earth; the best Stocks to inoculate upon, which must be done about *Midsummer*, are the *Damask*, the *White*, the *Frankford*, and wild *Eglantine*; care must be had that all Stocks of budded *Roses* be kept from Suckers, and the Buds to be inoculated as near the Ground as may be, that the budded Launce may be laid in the Earth to Root after one Years growth. You may likewise prick many holes with an Awl about a Joint that will lie in the Earth, and then cover the same with good Mould; this do in the Spring, and peg it down that it rise not again, and if watered now and then in dry Seasons, it will be so rooted by Autumn, as to be removed and cut from its other part behind the Root, and becomes a natural Tree; one whereof is more valuable, than two of the other that are only budded or ingrafted, because very many Suckers that come from them will be of the same kind. But all *Roses* being apt to yield Suckers, the fairest way to encrease them is gently to bend down part of the Tree, or the whole in the Spring, to lay all the Branches in the Ground, and to apply unto them old and well rotted Dung about the places where they are laid, which will make them root the sooner, and by Autumn there will be thereby as many rooted Trees of the same kind as Branches laid in the Earth, without prejudice to the old one, which when the new ones are cut off, may be easily reduced to its place again, and the next Year bear as plentifully as ever: neither will it prevent the bearing of Flowers, for the laid Branches will be

as plentifully stored, as if the Tree were erect, and not laid ; so that neither the profit nor pleasure of that Year is lost thereby.

The *Double yellow Roses* bear not so well when planted in the Sun as other *Roses*, but must be placed in the shade ; and for its better bearing, and having of the fairest Flowers, first, in the Stock of a *Frankford Rose*, put in the Bud of a *Single Yellow Rose* near the Ground, that will quickly shoot a good length, put into it a Bud of *Double yellow Rose* of the best kind at about a Foot higher in that Sprout ; keep Suckers from the Root, as in all other inoculated *Roses*, and rub off all Buds but of the desired kind. When big enough to bear, prune it very near the preceding Winter, cutting off all the small Shoots, only leaving the bigger, whose tops are also to be cut off as far as they are small. When it Buds for Leaves in the Spring, rub off the smallest of them ; and when for Flowers, if too many, let the smallest be wiped off, leaving as many of the fairest as you think the strength of the Tree may bring to perfection, which should be a Standard, and rather shaded than planted in too much heat of the Sun, and watered sometimes in dry weather, whereby fair and beautiful Flowers may be expected.

Shearing off the Buds when they are put forth, for the retarding of the blowing of *Roses*, is practicable enough ; and a second shearing of them may cause them to be still later, and so *Roses* may be had when no other Flowers are in being ; but then care must be taken that the whole Tree be served so : for if one part of it be only sheared, the part unsheared will spend that Strength and Sap which you expected would have put forth new Buds in the places of those cut off, and frustrate your design.

As soon as the *Roses* have done blowing, they  
must

must be cut with Shears pretty close to the Wood, and each Branch ought to be cut again with the pruning Knife near the Spring, and that close to the Leaf; Bud, and all that is superfluous take away to bring the Tree into a handsome form; they are hardy and endure the severest Winters well enough; and they may be dispersed up and down the Garden in Bushes, or to the Walls among the Fruit; or else set in Rows and Hedges, intermixing the several Colours in such a manner as to have no two alike. The well placing of them much advances their Prospect to the Eye. None of the *Rose* Trees should be left to grow too high; lower than a Yard and half in height is best; except the *Musk Roses* which will not bear well, except against a Wall, Pale or House-side, and must be suffered to grow eight or nine Foot, which is their usual height.

*Rue.*

*Rue* is multiplied by Seed that is of a black Colour and rugged, but 'tis usually propagated rather by its Layers and Slips than by its Seed. It makes pretty Borders for Flowers being kept clipt.

S.

*Sage.*

**S**AGE, whereof there are several sorts, the Red, Green, Small and Variegated; but the first is the best, and the young Leaves thereof a very wholesome Sallet in the Spring. It is commonly a Border Plant whose Culture hath nothing particular; it is like that of other Border Plants, as *Rosemary*, *Lavender*, *Wormwood*, &c. It is raised by setting the Slips and Branches in the beginning of

of *April*. The tender tops of the Leaves, but especially the Flowers should be sparingly cropped, yet so as not to suffer it to be too predominant.

### *Salsifie.*

*Salsifie* or *Goats-beard*. The common sort is multiplied only by Seed, which is of a very long oval Figure, as if it were so many Cods all over streaked, and as it were engraven in the Spaces between the Streaks, which are pretty sharp-pointed towards the end.

### *Spanish Salsifie.*

*Spanish Salsifie*, or *Scorzoner*a, is multiplied by Seed as well as the other, and is very good boiled, both for the pleasure of the Taste and the health of the Body. It is sown in *March*, and must be sown very thin, whether it be in Beds or Borders, or else at least it must be thinned afterwards, that the Roots may grow the bigger. It runs up to Seed in *June* and *July*, and is gathered as soon as it is ripe.

### *Samphire.*

*Samphire* is one of our Sallet furniture that is multiplied only by Seed, it should be planted by the sides of Walls exposed to the South or East. The open Air and great Colds are pernicious to it. It's usually sown in some Pot or Tub filled with Mould, or else on some side Bank towards the South or East, and that in *March* or *April*, and afterwards transplanted into those places abovementioned ; but the *French* Seed is better than our *English*.

### *Savory.*



*Savory.*

*Savory*, Winter and Summer, the latter being annual and raised of Seed; the other living over many Winters, and increased by slips as well as Seed: they are both, as to the uses of them, well known in the Kitchen, more particularly the Leaves are used to some Ragou's, and among Pease and Beans.

*Scallions*: See *Ciboules*.

*Scallions* are Herbs well known how to be propagated, whereof the red, hard, little, and sweet are the best, being very good to excite Appetite.

*Scurvy-grass.*

*Scurvy-grass* is raised of Seed. That of the Garden, but especially that of the Sea is a sharp biting and hot Herb of Nature, like unto *Nasturcium*, prevalent in the Scurvy, whereof a few of the tender Leaves may be admitted into our Composition of Sallet.

*Selery.*

*Selery* is only multiplied by Seed, which is of a yellowish and longish oval Figure, and a little bunched; it is not good but at the end of Autumn and Winter Season. It is first sown in hot Beds the beginning of *April*, and because of the extreme smallness of its Seed, you cannot help sowing it too thick, so that without thinning of it seasonably before it be transplanted, it warps and flags its head too much, and grows weak, shooting its Leaves outward in a stragling manner. In the transplant-

ing of it, the Plants are to be placed two or three Inches one from another, for which we make holes in the Nursery Bed with our Fingers; only what comes from the first sowing, is transplanted the beginning of *June*, about what time the second sowing is sowed, which is in open Beds at a Foot distance, and the same must be thin cropped and transplanted as the other, but more must be planted the second time than the first. The transplanting of them in hollow Beds is good only in dry Ground; so the second way of transplanting them is in plain Beds not made hollow, but both must be extreamly watered in Summer, which contributes to make them tender; and in order to whiten the same, begin at first to tie the *Selery* with two Bands when 'tis big enough in dry weather, then Earth it quite up with Earth taken from the high rais'd Pathways, or else cover it all over with long dry Dung, or dry Leaves, and this whitens it in three Weeks or a Month; but because when it is whitened it rots as it stands, if not presently eaten, it is not to be so earthed up or covered with Dung, but in such Proportion as you are able to spend it out of hand; hard Frosts quite spoil it, and therefore upon the approach thereof, it must be quite covered over; in order to which, after it is tied up with two or three Bands, it is taken up with the Earth at the beginning of Winter, planted in another Bed, and the Plants set as close to one another as may be, which will make them require much less covering than before when more asunder. To raise Seeds from them, some Plants must be transplanted into some by-place after Winter is past, which will not fail to run to Seed in *August*. There is but one sort of this Plant. The tender Leaves of the blanched Stalk do very well in our Sallets, as likewise the Slices of the white Stems, which being crimp and short, and

and first peeled and slit longwise, are eaten with Oil, Vinegar, Salt and Pepper, and for its high and grateful tast is ever placed in the middle of the grand Sallet at great Men's Tables. Have a care of a small red Worm that is often lurking in these Stalks.

*Skirrets.*

*Skirrets* are a sort of Roots propagated by Seed, and cultivated like other Roots, as is directed in the Month of *March*.

*Smallage.*

Some use this Herb in their Pottage, it's raised either by Slips or Seed, which is reddish and pretty big, of a roundish oval Figure, a little more full and rising on one side than the other, and streaked from one end to the other.

*Snap Dragon.*

*Snap Dragon*, *Antirrhinum*, has some pretty diversities. *First*, the *White Snap Dragon* very common. *Secondly*, The White variegated one like the other, but broader leaved divided in the middle and turned up on the edges, with many small long purplish Lines on the inside. *Thirdly*, The Red, which is of two or three sorts, the best flowered like the former of a deep red *Rose* Colour, but the other paler. *Fourthly*, The Yellow distinguished only from the common White in the Yellow Colour of its Flowers, they Flower from *May* to *July*, and the Seeds are ripe in *August*, they being all raised from Seed, bear Flowers the second Year, when the old Roots commonly perish; yet the Slips being taken off and set, will grow the

best, being those that do not rise to Flower, and the best time of setting them is the end of *May* or the beginning of *June*.

*Sorrel.*

*Sorrel*, of these are several sorts, of which the *French Sorrel* is the best; but of the common sort the largest is best for the Garden, and serves for many uses in the Kitchen, being raised easily enough from Plants, which should not be set too near, the same being apt to grow large and spread abroad; but the usual way of propagating it, is by Seed, which is small, slick and of a Triangular Figure, sharp pointed at the end, and of a dark Cinnamon Colour. It may be sown (of whatsoever sort it be) in *March*, *April*, *May*, *June*, *July* and *August*, and the beginning of *September*, provided sufficient time be allowed it to grow big enough to resist the vigour of the Winter, it's sown either in open ground, or else in straight Rows or Furrows, in Beds or Borders; in all which cases it must be sown very thick, because many of its Plants perish; the Ground it requires should be naturally good or well improved with Dung; it must be kept clean from Weeds, well watered, and once a Year covered with a little Mould after it's first cut down to the Ground. The Mould serves to give it new vigour, and the Seasons most proper for applying it are the hot Months of the Year.

Its Seed is gathered in *July*, by which it is propagated, tho' that called round *Sorrel* from the roundness of its Leaves (those of the other sort being sharp pointed) is multiplied by running Branches that take Root in the Earth as they run over it, which being taken off and transplanted produce thick Tufts, and these also other Runners.

*Spinage.*



*Spinage.*

*Spinage* is an excellent Herb crude or boiled, being multiplied by Seed only, that is pretty big, horned and triangular on two sides, having its Corners very sharp pointed and prickly; and on that part which is opposite to those pointed Horns, it is like a Purse of a greenish Colour. This Plant requires the best Ground, and is planted either in open Ground or in Furrows in streight Rows upon well prepared Beds, and this several times in the Year, beginning about the middle of *August*, and finishing about a Month after; the first is fit to cut about the midst of *October*; the second in *Lent*, and the last in *May*. They may be also sown early in the Spring. Those that remain after Winter run up to Seed towards the end of *May*, and are gathered about the midst of the Month following. They must be well ordered; and if the Autumn prove very dry, it will not be amiss to water them sometimes. They are never transplanted.

*Strawberries.*

*Strawberries* deserve a place in the Orchard or Garden, being humble and content with the shades and droppings of the more lofty Trees. There are various kinds of them, as the common *English Strawberry*, much improved by being transplanted from the Woods to the Garden, the *White Wood Strawberry* more delicate than the former, the *Long red Strawberry*, the *Polonian*, and the *Green Strawberry*, which is the sweetest of all, and latest ripe. But some esteem that the best of all which hath not long since been brought from *New-England*; it is the the earliest ripe of all *English*

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Fruit,

Fruit, being ripe many Years the first Week in *May*. They are of the best Scarlet Dye, and are propagated of Runners, which is a kind of Thread or String which grows out of the Body of the Plant, which easily takes Root at the points or knobs, and in two or three Months time are fit to transplant. They are planted either in Beds or Borders, and should be well watered. They thrive best in a moist Soil; the time of planting them is in *May* or *September*, in moist weather. They bear well the Year after they are planted. But if you would have *Strawberries* in Autumn, the first Blossoms which they put forth may be cut away, and their bearing hindered in the Spring, which will make them afterwards blow anew, and bear in their latter Seasons; and in order to get some of these of a larger size, as soon as they have done bearing, let them be cut down to the Ground, and cropt as soon as they spire, till towards the Spring: and when you would have them proceed towards bearing, now and then as you cut them, strew the Powder of dried Cow-dung, Pigeons-dung, Sheeps-dung, &c. upon them, and water them when there is occasion. Such as are red, thoroughly ripe, large, and of a pleasant odour, are the best, being agreeable to the Taste; they extinguish the heat and sharpness of the Blood, by refreshing the Liver. They should be transplanted once in three or four Years.

*Succory:*

*Succory* : See *Endive* :

# T.

*Tansie.*

**T**ANSIE is raised by Seeds, Slips or parting of the Roots; a Herb hot and cleansing, but in regard of its domineering relish, must be sparingly used with our cold Sallets.

*Tarragon.*

*Tarragon* is one of the perfuming or spicy Furnitures of our Sallets, being propagated both by Seeds and rooted Slips, and by setting of the tops which spring again several times after they are cut. It endures the Winter, and requires but little watering in the driest of Summers. When planted in Beds, it requires eight or nine Inches distance for each Plant one from another, and the best time for it is in *March* or *April*, which hinders not but that it may be transplanted again in the Summer Season. The best for use, is that which is fresh and tender, and not the Leaves which hang on the Ground, but the tops are to be preferred.

*Thistle Carduus* : See *Carduus* .

*Thyme.*

*Thyme* is of several sorts which are multiplied by Seed, that is very small, and those Plants or Stems of it that produce several rooted Slips and Suckers are separated to replant into Borders, for *Thyme* is seldom planted otherwise; a Border of it is a  
I i 4
considerable

considerable and necessary Ornament in a Kitchen-Garden.

### *Turneps.*

*Turneps*, whereof there are several sorts; the round which is the most common, the long otherwise called narrow, and the yellow. These are usually nourished in Gardens, and are properly Garden Plants, yet they are very advantageous being sown in Fields, not only for culinary Uses, but for Food for Cattel, as Cows, Swine, and of late Years, Sheep. They delight in a warm, mellow, and light Ground, rather sandy than otherwise, not coveting a rich Mould. The Land must be finely plowed and harrowed, and the Seed sowed and raked with a Bush (as I have shewed already.) They are sown at two Seasons of the Year; in the Spring with other like Kitchen Trade, and also about Mid-summer and after. Cows and Swine will eat them raw, if they are introduced into the Diet, by giving the *Turneps* first boiled to them, then only scalded, and last of all raw. It is a piece of great neglect amongst us, that the sowing of them is not more prosecuted, seeing the Land need not be very rich, and that they may be sown as a second Crop also, especially after early Pease. They supply the great want of Fodder that is usual in Winter, not only for fatning Beasts, Swine, &c. but also for Milch-Cows.

The Season for sowing this Plant for the Kitchen, is about Mid-summer, that they may be ready to improve upon the autumnal Rains, which makes them much sweeter than the *Vernal*, yet you may sow in *April* to have *Turneps* in the Summer. They must not be sown too thick, for that will hinder the growth of the Root; but if the over fatness of the Ground, which is a very great fault for *Turneps*,  
or



or overmuch wet causes them to run out into Leaf more than in Root, then treading down the Leaves will make them Root the better. And if the Roots of them are useful and palatable, the Greens or Leaves of such as have been sown late and lived over the Winter are so too. They being frequently boiled and eaten with salt Meats prove an excellent Condiment.

## V.

### *Violets.*

**VIOLET**-Plants, as well the double as single sort, and of what Colour soever they be, tho' they produce Seed in little reddish Shells or Husks, yet they are multiplied only by Slips, each Plant or Stock of them growing insensibly into a Tuft that is divided into several little ones, which being replanted grow in time big enough to be likewise divided into others. The *Double Violets* more particularly serve to make pretty Borders in our Kitchen-Gardens, their Flowers placed on the Superficies of Spring-Sallets making a very agreeable Figure.

## W.

### *Wormwood.*

**WORMWOOD** is multiplied by Seed that is of a pretty odd Figure, as being a little bent inward in its smallest part, and on the other end which is bigger and rounder, a little open, and upon which last end there is a little black spot. Its Colour is yellowish at the bigger end, and its sharper

sharper end inclines to black: its Seed is seldom used, because it is difficult to fan, it being very little; and therefore when there is occasion of propagating *Wormwood*, its Cuttings, that are a little rooted, are rather made use of. It's planted on Borders or Edges, in a line, at two or three Inches distance, and five or six deep in the ground. It is good to slip them every Spring, to renew them every two Years, and to take away their oldest and decayed Stocks. The Seed is gathered about *August*.

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## Chap. II.

**H**AVING given an Account of the several Herbs, Plants, &c. belonging to the *Kitchen-Garden*, I shall, before I proceed to the Description of the *Orchard* and *Fruit-Trees*, take notice of several sorts of *Flower-Trees*, *Winter-Greens*, and other Shrubs that will bear the Frost, which are both convenient and ornamental for the making of Hedges, Walks, and the Partitions of the several Quarters of Gardens, Orchards, &c. whose Shelter is of great Advantage to preserve your Gardens warm, as well as to afford a pleasant Prospect to the Eye; observing the same method with that of the *Kitchen-Garden*, I begin with

*Acacia.*

The *French* do mightily adorn their Walks with the *Virginian Acacia*: It endures all sharp Seasons but high Winds; which, because of its brittle nature, it does not well resist. The Roots which run like Liquorice under ground, are apt to emaciate the Soil, and therefore not fit for Gardens. It's increas'd by Suckers.

*Alaternus.*

The *Alaternus* thrives very well in *England* and bears the severest Frost. It makes fine Hedges, and is a quick grower; the Seed ripens in *August*, the Blossoms of which afford an early relief to the Bees: and the *Phyllyrea*, of which there are five or six sorts, are still more hardy, both which are raised of their own Seeds or Layers, only the *Phyllyrea* lies long in the Ground, and the *Alaternus* comes up in a Month after it's sowed. Being transplanted for  
Hedges

Hedges or Standards, they are to be governed by the Shears, and transplanted at two Years growth; clip them in Spring after Rain, before they grow sticky, while the Shoots are tender; thus it forms a fine Hedge planted in single Rows at two Foot distance, of a Yard thick and twenty Foot high if you think fit, and furnished with Branches to the bottom: Only because of the Winds, it may be necessary to support it with some Wall or Frame, if you let it grow to such a height.

*Almonsdwarf.*

*Almonsdwarf* is a very humble Shrub, bearing in *April* many fine Peach-colour'd Blossoms. 'Tis a very pleasant Plant, and yields plenty of Cions.

*Althæa Fruticosa.*

*Althæa Fruticosa*, or *Shrub-Mallow*, of which there are two sorts, the Purple and the White. They endure the Winter, and are usually planted Standards: they bring forth their Flowers in *August* and *September*, and last till the Wet or Cold spoils them: the Tree is increased by Layers.

*Arbutus.*

*Arbutus*, or *Strawberry Tree*, grows common in *Ireland*. It is difficult to be raised from the Seeds, but may be propagated by Layers. It grows to a goodly Tree, endures our Climate, unless the Weather be very severe, and makes beautiful Hedges.

*Bucks-horn Tree.*

*Bucks-horn Tree*, or *Virginian Sumach*, grows in some Places six foot high, the young Branches being



ing of a reddish brown, feeling like Velvet, and yielding Milk if cut or broken. The Leaves are snip'd about the edges, and at the end of the Branches come forth long, thick and brown Tufts, made of soft and woolly Thrums, among which appear many small Flowers: the Roots put forth many Suckers, whereby it's increased.

*Bays.*

*Bays* are propagated of Suckers, Layers and Seeds or Berries, which should be dropping ripe e're gathered. *Pliny* orders the Berries to be gathered in *February*, and spread till their Sweet be over, and then to be put in Dung and sown. Some steep them in Wine, but Water does as well; others wash the Seeds from their Mucilage by breaking and bruising the glutinous Berries: but the best way is to interr them as you furrow Pease, or rather to set them apart. Defend them the first two Years from piercing Winds. This aromatick Tree loves the Shade, but thrives best in hottest Gravel, on which Soil it best endures the Frost. Having passed the first Difficulties, Culture about the Roots wonderfully augments its growth. They sometimes grow thirty foot high, and two in diameter: they are fit both for Arbours and Palliâdo Work, if the Gardiner understands when to prune and keep them from growing too woody: the Berries are emollient, and sovereign in Distempers of the Nerves, they are used in Colicks, Gargarisms, Baths, Salves, Perfumes; and some use the Leaves instead of Cloves.

*Celastrus.*

*Celastrus*, or *Staff-tree*, bears a few green Leaves all Winter, and is fit to mix with the *Pyracantha* to make an ever-green Hedge. *Granade.*

*Granade.*

*Granade*, there are three sorts of them: they differ little in culture from the *Alaternus*: considerable Hedges may be raised of them in Southern Aspects: their Flowers are a glorious Recompence for our Pains in pruning them, they must be diligently purged of their Wood. If you plant them in Gardens to the best advantage, keep them to one Stem, and enrich the Mould with Hogs-dung well rotted. Plant them in a warm corner to have Flowers. If you plant them in Hedge-rows, loosen the Earth at the Roots, and enrich it Spring and Autumn, leaving but a few woody Branches. At the transplantation of them they should be well watered.

*Hypericum Frutex.*

*Hypericum Frutex* is a Shrub yielding abundance of small slender Shoots, which in *May* are very thick set with small white Blossoms, that the Tree seems to be all over hoary with Frost, or covered with Snow. It is increased by Suckers, and endures all Weathers.

*Judas-tree.*

The *Judas-tree* yields a fine purplish bright red Blossom in the Spring, and is increased by Layers or Suckers.

*Jessamine.*

*Jessamine*: There are several sorts of this Plant: First, the *White Jessamine*, that hath divers flexible Branches proceeding from the bigger Boughs that

that come from the Root; at the end of white young Branches come forth divers Flowers together in a Tuft, opening into fine white pointed Leaves, and of a strong sweet Scent, which fall away with us without seeding: Secondly, the *Catalonian* or *Spanish Jessamine*; that is not so high as the former, but bigger in Branches and Leaves as well as Flowers, which are white when opened, with blushed Edges, and sweeter than those of the former: Thirdly the *Double Spanish Jessamine*; its Flowers white like the first, but bigger and double, and consisting of two rows of Leaves that are sweet as the former: Fourthly, the *Yellow Jessamine*, which upon long Stalks bears small long hollow Flowers, ends in five, and sometimes six yellow Leaves, and are succeeded by black shining Berries: Fifthly, the *Indian Scarlet Jessamine*, whose Branches are so flexible as not to be able to sustain themselves without the help of something to support them: the Flowers come forth many together at the end of the Branches, being long like a *Fox-glove*, opening at the end into five fair broad Leaves, with a Stile in the middle of a Saffron colour. The *Jessamine* flowers from *July* to the middle of *August*, the first white and common yellow being hardy and able to endure our Winter and Colds, are increased by Suckers; but the *Indian Yellow*, or *Spanish*, must be planted in Boxes or Pots that they may be housed in Winter: they are usually increased by being grafted late in the Spring on the common white *Jessamine* by Approach; but they may be also propagated by Layers, or Suckers.

### *Laurus Tinus.*

*Laurus Tinus* is a Shrub yielding sweet-scented Tufts of white Blossoms in the Winter as well as Summer,

Summer, is easily propagated from Suckers or Layers, and makes a fine Hedge.

*Lentisc.*

*Lentisc* is a beautiful ever-green, thrives abroad with us with a little Care and Shelter: It may be propagated by Suckers and Layers: It makes the best Tooth-pickers in the World; and the Mastick or Gum is of excellent use, especially for the Teeth and Gums.

*Lilac.*

*Lilac* or *Pipe-tree*, which affords fine scented Flowers in *April* and *May*, and is a Tree yielding plenty of Suckers, by which 'tis propagated.

*Maternus.*

*Maternus* is a hardy Shrub, being something of the Species of the *Phyllyrea*, and doth as well for Hedges, being as easily managed.

*Mezereon.*

*Mezereon*, or *Dwarf-bay*, rises according to its Age from one to two, three, or four foot high in a Bush full of Branches with whitish round pointed Leaves, that appear not till the Flowers are past, which are of a pale Peach-colour, some others near red, and a third milk-white, and sweet-scented; they are succeeded by small Berries, when ripe of a delicate red: the Berries and Seeds are to be sown in good light Earth in Boxes as soon as they are ripe, or else such Earth laid under these fine Shrubs for the seeds as they ripen to fall into, and afterwards covered with the same Mold, not too thick.

*Periploca.*



*Periploca.*

*Periploca* is a Plant that twists it self about a Pole like a Hop, and lives over the Winter, and yearly puts forth small blue Blossoms. 'Tis increased by Layers.

*Privett.*

*Privett* is a Plant that hath been in request for adorning Walks and Arbours; but is of late disused.

*Pyracantha.*

*Pyracantha*, this Tree deserves a principal place among those used for Fences, it yielding a very strong and firm prickly Branch and ever-green Leaves. But it thrives best in standards, because with often clipping it's apt to grow sticky. It is quick of growth, and raised either of the bright Coralline-berries, which hang for the most part of the Winter on the Trees, and lie as long in the Ground ere they spring as the Haw-thorn-berries; or else it is raised of Suckers or Slips.

*Sena.*

*Sena-tree* is of two sorts, the *Bastard Sena* and the *Scorpion Sena*, both which yield a pleasant Leaf and Flower: they grow but slender, and so need the Support of a Wall or Pales; but being consile, they may be reduced to any other form; and may be raised by Layers or Seeds.

*Spanish Broom.*

*Spanish Broom* is not much unlike the *Yellow Jessamine*, only the Flowers are larger. It flowers in *May*, and is increased by Seeds or Suckers.

*Spirea Frutex.*

*Spirea Frutex* is a small Tree bearing small Peach-coloured Blossoms about *August*. 'Tis a hardy Tree, and is increased by Layers.

*Tamarisk.*

*Tamarisk* is a Tree that grows tall and great, being increased by Suckers and Layers, and usually planted by those who respect Variety and Pleasure. Its Wood is also medicinal.

*Virginian Climber.*

*Virginian Climber*, or *Maraca*, comes out of the Ground in *May* with long round winding Stalks, more or less, and in height according to the Age. From the Joints come the Leaves, and at each one, from the middle to the top, a Clasper like a Vine, and a Flower; also the Leaves are of a whitish Colour, having towards the bottom a Ring of a perfect Peach-colour, and above and beneath it a white Circle: but the stronger part is the Umbrane, which rises in the middle, parting it self into four or five crooked spotted Horns, from the midst whereof rises another roundish Head that carries three Nails or Bars, biggest above and small at the lower-end. It bears Fruit like a Pomegranate. Its beautiful Flowers shew themselves in *August*, the Stalk dying to the Ground

Ground every Winter, springing again from the Roots in *May*, which should be covered and defended from hard Frosts in Winter. It should be planted in a large Pot, to hinder the Roots from running; and for housing in Winter, and setting in the hot Sun in Summer, it must have the hottest place that may be, or it will not bear at all. The Pots may be set in the Spring in hot Beds to bring them forwards.

*Woodbine, or Hony-suckle.*

*Honey-suckles* bear a fine Flower, and especially those of the double red sort, and may be brought to cover Arbours or to adorn other parts of the Orchard, being to be clipped into any form, and are easily raised of Layers.

• *Yucca.*

*Yucca* is an *American* Plant, but hardier than we take it to be: It will suffer our sharpest Winter without setting in Cases. When it comes to some Age it bears a Flower of admirable Beauty; and being easily multiplied, might make one of the best and most ornamental Fences in the World for Gardens.

Most sort of Fruit-trees, as Apples, Cherries, Codlings, Plumbs, &c. make good Hedges, and afford a good Shelter, being planted to divide Gardens, Orchards, &c.

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## BOOK XIV.

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### Chap. I. *Of Fruit-Trees.*

**H**AVING treated of the *Kitchen-Garden*, I shall next consider the *Orchard*, there being nothing more profitable than the Planting of Fruit-Trees; of which *Worcestershire*, *Herefordshire*, *Gloucestershire*, *Kent*, and many other places, can give us ample Instances: And therefore it will be necessary, more particularly, to consider the Improvement that is to be made of this part of Husbandry, and the Advantages of it, which consist in many Particulars: as,

First, in the Universality of it; there being hardly any Soil, but one sort of Fruit-trees or other may be raised on them, especially if judiciously managed.

Secondly, the Use of Fruit is also universal both for Eating and Drinking, there being hardly any Places where, of late Years, Fruit is not much made use of, especially the Juice for Cyder; which being made of good Fruit, and well prepared, is a most delicious, wholesome Liquor, and most natural to our *English* Bodies, there being no County in *England* that hath afforded longer-liv'd People than the Cyder Counties. The greatest Inconvenience that attends it, is, that it is a very ticklish Liquor, and requires a great deal of Art and Skill to manage, as I shall have occasion to shew hereafter.

Thirdly, in the Charges and Expences of it, which are very small, especially if compared with that of other parts of Husbandry, there being hardly



hardly any more required than the trouble of gathering them, after a few Years at first, which is a very inconsiderable Charge to the Profit and Advantage that accrues to the Owner afterwards. Mr. *Hartlib*, in his *Legacy*, telling us of the Benefit of Fruit-trees, says, " That they afford curious Walks, Food for Cattel in Spring, Summer, and Winter, Fuel for the Fire, Shade from the Heat, Physick for the Sick, Refreshment for the Sound, Plenty of Food for Man, and that not of the worst, and Drink also of the best, and all this without much Labour, Care, or Cost.

So that considering the great Expence of the other parts of Husbandry; as also the Charge of Plowing, Sowing, Reaping, Inning, and Thrashing of Corn, it will come much short of the Profit of Fruit-trees; nay, many times Fruit amounts to more than Corn will yield, tho' the Charges were not deducted.

And I cannot but think Fruit-trees a great Improvement of the Land where they are planted, in that the Grass which grows underneath them will be forwarder in Spring than any other, and if mowed will yield twice the quantity of Hay: but the mowing of Orchards being prejudicial to the Trees, I shall rather advise the keeping of it short fed with Cattel the fore-part of the Summer (especially if your Plantation is so large that you cannot keep it constantly dug) which the Cattel will then eat as well as other Grass; and if it should grow rank, and get a-head of you the latter part of the Year, let it but stand till the Frost nips it, and the Cattel will be glad of it: but I think Trees may be so planted both in Orchards and Fields as only to shade the Grass and prevent the burning of it in Summer, and to drop on the Grass but very little, which is the only occasion

of its Sourness, as I shall endeavour to shew afterwards. And that the Leaves of Trees are a very great Improvement of Land, may be seen by small Inclosures, which are commonly richer and more fruitful than large Fields adjoining to them, tho' of the same Soil; of which also Woods are an evidence, by the Improvement they make of any sort of Soil they are planted on. And that Fruit-trees are a great Improvement of Land, is the Opinion not only of the Ancients, who have composed many large Volumes to encourage this Work, giving it the greatest Encomiums, and preferring it before most other Employments; but likewise of Mr. *Blith*, Mr. *Austen*, and all others that have writ lately on this Subject, in that they cause Land to yield a double Crop, and increase the Advantage of its common Produce of Grass too. And besides the Advantage that accrues to the private Owner, it would be of benefit to the Publick to have Fruit-trees much more propagated than they are, in that it would hinder the vast Consumption of *French Wines*, which is the enriching of a Foreigner by a Trade very prejudicial to this Nation, and instead of it might procure to us a considerable foreign Trade, of no less Advantage than the other has been prejudicial. In order therefore to advance and promote this useful part of Husbandry, I shall first begin with the Seminary and Nursery, as what is the first Work to be taken care of where you have not the opportunity of buying Trees, or that you design the raising of them your self.

**Chap. II. Of the Seminary and Nursery for Fruit-Trees.**

**T**HE Seminary and Nursery of Fruit-trees is to be ordered much after the same way as is before described for Forest-trees: as first, You must towards *October* cleanse the Ground of Weeds, Roots, &c. which you design for this purpose; and note, that wet or very stiff Clay, and Land rich with Dung, is not good for this Use. Make the Mould very fine, and where you can get Crab-stocks enough in the Woods, you may plant your Nursery with them; but if your Nursery be large, and they are hard to get, your Dependency must be upon those you raise in your Seminary, which are esteemed the best. The way of doing of which, is to keep the Stones of such Fruit as is early ripe in Sand till *October*; and then stretching of a Line cross your Beds, if you make Beds for them, prick Holes by it about a hand's-breadth distant one from another, setting of the Stones about three inches deep: and having finished one Row, remove your Line to another, which must be about a foot distance from the former; and so you may go on with your setting of them if you raise your Seeds on Beds; but if not, your Rows must be two foot or more distant from one another, that so you may have liberty to go between to weed them, observing to keep each sort by themselves. All kind of Nuts, &c. may be set in the same manner: And for Stocks raised from the Seeds of Kernels, of Apples, Pears, or Crabs, some propose this Method; which is, After having made any Cyder, Verjuice, or Perry, to take the Must, which is the Substance of the Fruit after the Juice is pressed out, and the same Day, or next after, before it heats, have the Seeds sifted



out of it with a Riddle, on a clean Floor or Cloth, which sow as soon as may be upon Beds of fine Earth very thick, for some being bruised in the grinding or pounding, and others not being ripe, many will never come up; upon them sift fine Mould about two Fingers thick, laying *White-thorns* or *Furze* on them till the Ground is settled, to prevent the Birds or Fowls from scraping of them up: and to keep them warm in the Winter, lay some *Fern* or *Straw* on them, which you must be sure to remove in Spring before the Seeds begin to shoot, which is commonly in *May*, and likewise to keep them well weeded; and if the Summer happen to be dry, they may be sometimes watered. Be careful likewise to set Traps for the Moles and Mice, which are very greedy of them; or you may, as some say, poison the Mice with pounded Glass mixed with butter and Oatmeal, and cast in bits upon the Beds.

*Crab-Stocks.*

The best Stocks to graft on are those that are raised of the Kernels of Wildings and Crabs of the most thriving Trees, tho' in *Herefordshire* they reckon the *Gennet-Moyl*, or *Cyddoddine* Stock (as they call it) to be the best Stock to preserve the Gust of any delicate Apple, it being observable that the *Wild-stock* enlivens the dull Apple, and the *Gennet-Moyl* sweetens and improves the over-tart Apple, but that the Tree lasts not so long as if grafted on a Crab-stock; and tho' the Fruit doth always take after the Graft, yet it is something altered by the Stock, either for the better or worse.

To be furnished with such variety of Stocks as is necessary for the several sorts of Fruit-trees that you are to raise, the Seminary ought to be filled with such as are raised of Peach-stones, Plumb-stones, Cherry-stones, Quince-stocks, &c. or of such as are raised of Suckers from the same, which  
are



are as good according to what each sort of Tree requires; of which I shall give an Account hereafter.

But the best and most expeditious way to raise *Quince-Stocks*, a great quantity of Quince-stocks for your Nursery, is to cut down an old Quince-tree in *March* within two inches of the Ground, this will cause a multitude of Suckers to rise from the Roots. When they are grown half a Yard high, cover them a foot thick with good Earth, which in dry times must be watered; and as soon as they have put forth Roots in Winter, remove them into the Nursery; where in a Year or two, they will be ready to graft with Pears.

Plumb-stocks and Cherry-stocks may also be *Plumb-Stocks*, raised from Suckers as well as from Stones, only you must have regard to the kinds from whence they proceed, because of the sorts you graft or inoculate on.

Pear-stocks may also be raised of Suckers, and *Pear-Stocks*, transplanted like the former; but those that are raised of seeds or Stones are esteemed much better than those raised from Suckers or Roots.

These Stocks when they are two Years old, or one Year according to some, are best to be removed into the Nursery, tho' they are never so small, provided they make but large Shoots; where after they come to make strong Shoots, they may be grafted, inoculated, &c. according to their Nature, and the Use you design them for, observing to cut off the down-right Roots and the Tops and side Branches of the Plants, leaving of them about a foot above the Ground, and letting neither the Roots be too long nor set too deep, because they will be removed afterwards with the more ease: and it is necessary to remove Seed-plants often as well as Forest-trees, because by that means they get good Roots, which otherwise

wise they thrust down only with one single Root. And observe to set the biggest and least by themselves in different places.

Fruit-trees being of several kinds, and raised and increased several ways, as by grafting, inoculating, or budding, some by Seeds or Nuts, and others by Layers, Cuttings, Suckers, Slips, &c. according to the nature of them; and you having furnished your self with several sorts of Stocks for these purposes: I shall in the next place endeavour to shew the Manner of using them, and the particular Ways and Methods used for the raising of each several sort of Trees, and begin with Grafting.

### Chap. III. *Of Grafting of Trees.*

**C**HOOSE your Grafts from a good bearing Branch, and from an old Tree rather than a young one, and covet not one that is too slender, lest the Sun and Wind dry it too much, and cause it to wither. The best Cions are reckoned such as are of the last Year's Wood, and that have some of the former Year's Wood to them, which is stronger to put into the Stock than the last Year's Wood, and is reckoned to advance the bearing of the Graft; but a Graft only of the last Year's Shoot will do very well; tho' in *Herefordshire* they commonly chuse a large Graft: however, those Cions are esteemed the best, whose Buds are not far asunder, which usually determines the Length of the Graft.

And as the Stock is more or less thriving, and is capable of yielding of more or less Sap, so let the Graft have more Buds; but ordinarily three or four are sufficient.

And tho' you may graft and inoculate at most times of the Year, either by beginning early in the

**t**he Autumn, or by budding in the Summer; yet the principal time for Grafting is the Month of *February*, for Cherries, Pears, Plumbs, and forward Fruits, and *March* for Apples. Mild open Weather is best, and most propitious for this Work; and if you stay till you can be pretty certain of the Frosts being over, tho' it be to the beginning or middle of *April*, if 'tis a late Spring, it will be the better.

Observe that a Graft cut some time before, and stuck in the Ground, and then grafted at the rising of the Sap, takes better than those that are grafted so soon as cut.

As to the Success of Grafting, the main point is to joyn the inside of the Bark of the Cion and the inside of the Bark of the Stock together, that so the Sap that runs between the Bark and the Wood may be communicated from the one to the other, especially towards the bottom of the Cion.

Choose the straitest and smoothest part of the Stock for the place where you intend to graft, but if the Stock be all knotty or crooked (which some esteem no Impediment) rectifie it with the fittest posture of the Graft you can; and if your Stock be small, graft it about six inches above the Ground; but if it is large, and where Cattle come, it is best to place it above their reach: in which way of Grafting there is a great Advantage to some sort of Apples, in that it causes them to partake more of the Sap of the Crab, which makes the Fruit of a sharp brisk Taste, and much helps sweet Apples, and is a particular Advantage to *Golden-Pippens*; tho' for young Trees for Standards it's not so practicable, because Trees so grafted cannot be so well removed: but if your Stock be removed, it should stand at least three Years before



fore 'tis grafted, except it makes very large Shoots the second Year.

Graft your Cions on the South-west side of the Stock, because that is the most boisterous Wind in Summer; by which means the Wind will blow it to the Stock and not from it, which is the way that the Graft will best bear the Force of it: but as to this point, the Shelter that the Grafts have in their standing is chiefly to be regarded.

Be careful that the Rain get not into the Cleft of your young grafted Stocks, but keep them clayed till the Bark is grown over them, and leave not the Grafts above four or five inches in length above the Stock, because its being long occasions its drawing more feebly, and exposes it more to the shocks of the Wind and the Hurt of the Birds.

Only the *Gennet-Moyl* is commonly propagated by cutting off the Branch a little below a Bur-knot, and setting of it without any more Ceremony; but if they are grafted first as they grow on the Tree, and when they have covered the Head, are cut off below the Bur and set, it is much the best way: only in the Separation you should cut a little below the Bur, and peel off or prick the Bark almost to the Knot. And thus if the Branch have more Knots than one, you may graft and cut off yearly till within half a foot of the Stem, which you may graft likewise, and so let it stand.

To perform this Work well, it is necessary to be provided with a good strong Knife, with a thick Back, to cleave the Stocks with; a neat small Hand-saw, to cut off the Head of the large Stocks; a little mallet and a grafting Chisel, and a sharp Pen-knife to cut the Grafts. You must likewise have a stock of Clay well mixed with Horse-dung to prevent its Freezing, and with Tanners hair to prevent its cracking, Bass-Strings  
or



or Woollen Yarn to tie Grafts with, and a small Hand-basket to carry them in, with such other Instruments and Materials as you judge necessary according to the way and manner of grafting that you design to use, which is performed several ways, as,

First, By grafting in the Cleft, which is the *Cleft grafting.* most known and ancient way, and the most used for the middle-sized Stocks: the way of doing of which is, first to saw off the Head of the Stock in a smooth place, and for Wall-trees or Dwarf-trees to graft them within four fingers of the Ground, and for tall Standards higher, as you think convenient, or your Stocks will give way to do. Pare away with your Knife the roughness the Saw hath left on the Head of the Stock, and cleave the Head a little on one side of the Pith, and put therein your grafting Chisel or a Wedge to keep the Cleft open, which cut smooth with your sharp Knife, that the top may be level and even, except on one side, which must be cut a little sloping; then cut the Graft on both sides smooth and even from some Knot or Bud in form of a Wedge, futable to the Cleft, with a small Shoulder on each side; which Graft so cut, place exactly in the Cleft, so as that the inward Bark of the Cion may joyn to the inward part of the Bark or Rind of the Stock closely, wherein lies the principal skill and care of the Grafter if he expects an answerable success of his Labour, as was said before: then draw out your grafting Chisel or Wedge; but if the Stock pinch hard, lest it should endanger the dividing of the Rind of the Graft from the Wood, to the utter spoiling of it, let the inner side of the Graft that is within the Wood of the Stock be left the thicker, that so the woody part of the Graft may bear the stress, or rather leave a small Wedge in the Stock to keep

keep it from pinching the Graft too hard, and then you may leave the out-side of the Graft a little thicker, especially in smaller Stocks. Cover the Head of the Stock with tempered Clay, or with soft Wax, to preserve it not only from the extremity of the cold and drying Winds, but principally from the Wet.

*Rind grafting.*

The Second way of grafting, and much like unto the former, is grafting in the Rind or Bark of the greater Stocks, and differs only in this, that where you cleave the Stock and fasten the Grafts within the Cleft in the other way ; here you with a small Wedge of a flat half-round form, cut tapering to a thin point, made of Ivory or Box or other hard Wood, you only force the Wedge in between the Rind and the Stock till you have made a Passage wide enough for the Graft ; after the Head thereof is sawn off, and the Roughness pared away, then you are to take the Graft, and at the shoulder or gross part of it cut it round with your small Grafting-knife, and take off the Rind wholly downwards, preserving as much of the outward Rinde as you can ; then cut the Wood of the Graft about an Inch long, and take away half thereof to the Pith, and the other half taper away like to the form of the Wedge, set it in the place you made with your Wedge between the Bark and the Stock, that the shouldering of the Graft may joyn closely to the Wood and Rind of the Stock, and then with Clay and Horse-dung cover it as you do the other.

This way is with most conveniency to be used when the Stock is too big to be cleft, and where the Bark is thick. Here you may set many Grafts in the same Stock with good success ; and the more you put in, the sooner the Bark will cover the Wound.

*Whip grafting.*

The third way of Grafting that is made use of  
is

is to be performed somewhat later than the other, and is to be done two ways: first, By cutting off the Head of the Stock, and smoothing of it, as in Cleft-grafting; then cut the Graft from a Knot or Bud on one side sloping, about an inch and a half long, with a shoulder, but not deep, that it may rest on the top of the Stock; the Graft must be cut from the shouldering smooth and even, sloping by degrees that the lower end be thin; place the shoulder on the head of the Stock, and mark the length of the cut part of the Graft, and with your Knife cut away so much of the Stock as the Graft did cover (but not any of the Wood of the Stock:) place both together, that the cut part of both may joyn, and the Saps unite the one in the other; and bind them close together, and defend them from the Rain with tempered Clay or Wax, as before.

The other way of Whip-grafting is, where the Grafts and the Stocks are of one equal size: The Stock must be cut sloping upwards from one side to the other, and the Graft after the same manner from the shoulder downwards, that the Graft may exactly joyn with the Stock in every part, and so bind, and clay or wax them, as before.

These ways of Whip-grafting (especially the first) are accounted the best; first, because you need not wait the growing of your Stocks, for Cleft-grafting requires greater Stocks than Whip-grafting doth: secondly, this way injureth less the Stock and Graft than the other: thirdly, the Wound is sooner healed, and upon that account better defended from the nipping of the Weather, which the cleft Stock is incident unto: fourthly, this way is more facile both to be learned and performed.

The fourth way of Grafting is by Approach or *Grafting by Approach.* Ablactation: and this is performed later than the former



former ways; to wit, about the Month of *April*, according to the Forwardness of the Spring. It's to be done where the Stock you intend to graft on, and the Tree from which you take your Graft, stand so near together that they may be joyned: upon which account it is commonly practised upon *Orange* and *Lemon* Trees, and other rare Plants that are preserved in Cases, and may upon that account be joyned with the more facility. Take the Sprig or Branch you intend to graft, and pare away about three inches in length of the Rind and Wood near unto the very Pith; cut also the Stock or Branch on which you intend to graft the same, after the same manner, that they may evenly joyn each to other, and that the Saps may meet; and so bind and cover them with Clay or Wax, as before.

As soon as you find the Graft and Stock to unite, and to be incorporated together, cut off the Head of the Stock (hitherto left on) four inches above the binding, and in *March* following the remaining Stub also, and the Cion or Graft underneath, and close to the grafted place, that it may subsist by the Stock only.

Some use to cut off the Head of the Stock at first, and then to joyn the Cion thereunto after the manner of Shoulder-grafting, differing only in not severing the Cion from its Stock. Both ways are good, but the first most successful. This manner of Grafting is principally used for such Plants as are not apt to take any other way; as, for Oranges, Lemons, Pomegranates, Vines, Jessamines, *Althæa Frutex*, and such like. By this way also may Attempts be made to graft Trees of different kinds one on another, as Fruit-bearing Trees on those that bear not, and Flower-trees on Fruit-trees, and such like.

These



These are the most usual ways of Grafting; some others there are, but they differ very little from the former; and where they differ, it's rather for the worse, and therefore not worth the mentioning.

Those Grafts that are bound you must observe to unbind towards *Midsummer*, lest the Band injure them.

Where their Heads are so great that they are subject to the Violence of the Winds, it's good to preserve them by tying a Stick to the Stock which may extend to the top of the Graft, to which you may bind the Graft the first Year: the best thriving Grafts are most in danger; afterwards they rarely suffer by the Winds.

Grafts are also subject to be injured by Birds, which may be prevented by binding some small Bushes about the tops of the Stocks.

There is another way of Grafting that hath not been so long in use as the former; which is, to take a Graft or Sprig of the Tree you design to propagate, and a small piece of the Root of another Tree of the same kind or very near it, and Whip-graft them together; and binding of them well, you may plant this Tree where you have a mind it shall stand, or in a Nursery, which piece of Root will draw Sap and feed the Graft, as doth the Stock the other way. *Root grafting.*

Only you must observe to unite the two But-ends of the Graft and Root, and that the Rind of the Root join to the Rind of the Graft.

By this means the Roots of one Crab-stock or Apple-stock will serve for 20 or 30 Apple-grafts; and in like manner of a Cherry or Merry Stock, for as many Cherry-grafts: and so of Pears, Plumbs, &c.

Thus may you also raise a Nursery of Fruit-trees instead of Stocks; by planting of them there while they are too small to be planted abroad.

This is also the best way to raise tender Trees that will hardly endure grafting in the Stock; be-  
cause

cause this way they are not exposed to the Injuries of the Sun, Wind and Rain.

It is also probable, that Fruits may be meliorated by grafting them on Roots of a different kind, because they are more apt to take this way than any other.

The Trees thus grafted are reckoned to bear sooner and to be more easily dwarfed than any other, because part of the very Graft is within the Ground, which being taken off from a bearing Sprig or Branch will blossom and bear suddenly in case the Root be able to maintain it.

The only Objection against this way is this, that the young Trees grow slowly at the first, which is occasioned by the smallness of the Root that feeds the Graft; for in all Trees the Head must attend the increase of the Roots, from whence it hath its Nourishment.

Nevertheless this Work is easily performed, Roots being more plentiful than Stocks, and may be done in great quantities in a little time within doors, and then planted very easily with a slender Dibble in your Nursery, and will in time sufficiently recompence your pains.

But for the encouragement of those that desire to be furnished with good Fruit and good Bearers, Grafts may be carried with a little care either by Sea or Land, and will keep good from *October* to *March*, provided they are buried in Earth and kept moist, tho' without any thing put to them: they will keep a great while, so as that I my self had some Pear-Grafts which grew well that were sent from *Paris*: only if you find them any thing dry, lay them as soon as you receive them, in Water twenty four hours, and afterwards in moist Earth; or you may stick the large ends of them in Clay, tying a Rag about them to keep it from falling off, and to wrap the other end in Hay or Straw Bands, which

which will secure them from the Wind and Bruises, and is a good way for transporting of them.

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#### Chap. IV. Of Inoculation.

**I**NOCULATION is by some preferred before any of the ways of Grafting before treated of, and differs from the other ways, in that it is performed when the Sap is at the fullest in Summer, and the other sorts of grafting are before the Sap ascends, or at least in any great quantity. Also by this way of inoculating several sorts of Fruits and Trees may be propagated and meliorated, which by grafting cannot be done, as the *Apricock*, *Peach* and *Nectarine*, which rarely thrive any other way, because few Stocks can feed the Graft with Sap so early in the Spring as the Graft requires, which makes it frustrate your expectation; but being rightly inoculated in the fulness of the Sap rarely fails.

The Stocks on which you are to inoculate are to be of the same kind as before directed to graft on.

The time for this Work is usually from *Midsummer* to the middle of *July*, when the Sap is most in the Stock. Some Trees in some places and in some Years you may inoculate from *Mid-May* to *Mid-August*. As to the time of the Day, it is best in the Evening of a fair Day, in a dry season; for Rain falling on the Buds before they have taken will destroy most of them.

The Buds you intend to inoculate should neither be too young or tender, nor yet too old, but young ones are best; the *Apricock* Buds are ready soonest, they must be taken from strong and well-grown Shoots of the same Year, and from the strongest and biggest end of the same Shoots.

If Buds be not at hand, the Stalks containing them may be carried many Miles and kept 2 or 3

Days,

Days,



Days, being wrap'd in fresh and moist Leaves and Grass to keep them cool: If you think they are a little withered, lay the Stalks in cold Water two or three hours, and that, if any thing, will revive them and make them come clean off the Branches.

Having your Buds and Instruments ready for your work, *viz.* a sharp pointed Knife or Penknife, a Quill cut half way and made sharp and smooth at the end, to divide the Bud and Rind from the Stalk, Woollen-Yarn, Bass-matt, or such like, to bind them withall; then on some smooth part of the Stock, either near or farther from the Ground, according as you intend it, either for a Dwarf Tree, or for the Wall, or a Standard, cut the Rind of the Stock overthwart, and from the middle thereof gently slit the Bark or Rind about an Inch long, in form of a T, not wounding of the Stock; then nimbly prepare the Bud by cutting off the Leaf and leaving of the Bark about half an Inch above and below the Bud, and sharpen that end of the Bark below the Bud like a Shield or Escutcheon, that it may the more easily go down and unite between the Bark and the Stock: then with your Quill take off the Bark and Bud dextrously, that you leave not the Root behind; for if you see a hole under the Bud on the inside, the Root is left behind, therefore cast it away and prepare another; when your Bud is ready, raise the Bark of the Stock on each side of the slit (preserving as carefully as you can the inner thin Rind of the Stock) put in with care the Shield or Bud between the Bark and Stock, thrusting it down until the top join to the cross-cut, then bind it close with Yarn, &c. but not on the Bud it self.

There is another way of Inoculation more ready than this, and more successful, and differs from the former only in that the Bark is slit upwards from



from the cross-cut and the Shield or Bud put upwards, leaving the lower end longer than may serve; and when it is in its place, cut off that which is superfluous, and joyn the Bark of the Bud to the Bark of the Stock, and bind it as before, which sooner and more successfully takes than the other.

You may also cut the edges of the Bark about the Bud square, and bind it fast, and it will succeed well; which is the readier way, and easier.

About three Weeks or a Month's time after your Inoculation you may unbind the Buds, lest the binding injure the Bud and Stock.

When you unbind them you may discern which are good and have taken, and which not, the good will appear verdant and well coloured, and the other dead and withered.

In *March* following cut off the Stock three Fingers above the Bud, and the next year cut it close, that the Bud may cover the Stock as Grafts usually do.

## Chap. V. *Of the Ways and Methods used for the raising of Fruit-Trees.*

**H**AVING already shewed how to furnish your Seminary with Stocks, and the method of Grafting, Inoculating, &c. of them, I shall in the next place consider the several sorts of Fruit-Trees and what ways and Methods are the best and most proper for the propagation of each of them: I begin with the *Apple*, which deserves the preheminance, both upon the account of its universality and usefulness, being both Meat and Drink, it may be had at all times of the Year. Of *Apples* there are great variety and for several uses; but as *Apples* and *Pears* and other sorts of Fruit are of

several kinds, I shall have occasion to mention a great number of them hereafter, and at present, only take notice of some peculiar *Apples* and *Pears* proper for *Cyder* and *Perry*.

*Apples, how  
raised.*

*Apples* are commonly raised by grafting upon the Crab, that being esteemed the best and hardiest Stock for them, and the least subject to Canker; they take best when grafted in the Cleft or Bark, except the *Gennet Moyle*, which will grow of Burrs, as I have mentioned before, and the *Codlin*, which may be raised of Suckers or Slips, tho' indeed most of our best Fruit has been produced from the Kernel, being a kind of Wilding, as the *Red-streak*, the *Golden Pippin*, &c. are reported to be: but it being very rare that any can be raised this way, most Kernels producing Fruit of a wild austere sharp taste, tending rather to the wildness of the Stock on which the Tree was grafted, than that of the Graft; although many of them may seem fair, yet they want that briskness of Spirit, and are more woody than the grafted Fruit, being also much longer before they bear, and are more unfruitful; for the often grafting of Trees upon the same kind, is esteemed a meliorating of them, which hath occasion'd many to endeavour the raising of new kinds of *Apples* and other Fruits by grafting of them upon different Stocks, which way I think deserves encouragement; If any should attain to any sort of Graft of this kind, I think it would be convenient at the second, or at farthest, at the third Year's growth, to graft it upon a Stock of a more natural kind to it, for Nature delights more in an advance than going backwards. By a failure in this point I lost several Grafts that I believe would have been of advantage had I been aware of the sudden Blast that took them the third Year. I think Experiments of this kind more likely to succeed by trying a dry or an insipid Fruit upon

upon a pungent vigorous Sap, than the contrary ; but for the gaining of a new Species of *Apples*, tho' 'tis rare to have them take, yet I think the doing of it by Seeds and Kernels the most likely way, because many have been procured that way. I have obtained four several sorts of this kind my self.

Next unto *Apples* I think *Pears* may come in the second place, and would be much more useful Pears, how raised. than they are, were such care taken to improve the Juice of them as might be ; in one thing they are to be preferr'd, that they prosper in cold, moist, hungry, stony and gravelly Land, where *Apples* will not bear so well ; they are best grafted the same way as the *Apple*, and upon the wild *Pear-stock* raised of their Kernels for Standards ; but for *Dwarf* or *Wall-Trees* the *Quince-stock* is esteemed the best, but then they should be planted in moist Ground ; they will grow likewise when grafted on the *White-Thorn*, but not so well as on the former ; they may likewise be budded on their own kind.

*Cherries* are a fine Summer Fruit, and are of several sorts ; they do best grafted on the *Black-Cherry-stock* or the *Merry-stock*, which may be raised in great quantities from *Cherry-stones*, Suckers also from the Roots of the *Wild* or *Red-Cherry* will do well, they are commonly grafted about a Yard from the Ground by whip-grafting ; they may likewise be budded or inoculated on their own kind. Cherries, how raised.

*Plums* are of several sorts and commonly cleft-grafted on any Stocks of their own kind except the *Damascen* ; but one of the best sorts to graft them on is the *Pear-plum* ; tho' I have often found them to prove well raised only from the Stones, especially *Damascens*. Plums, how raised.

*Medlars* may be cleft or Stock-grafted on the *White-thorn*, but prove best on the *Pear* or *Quince-stock*. Medlars.



Filberts.

*Filberts* may be cleft-grafted on the common Nut, and *Servises* on their own kind, or propagated by Suckers, Layers or Seeds.

Quinces, how raised.

*Quinces* may be cleft-grafted on their own kind, or raised of Slips or Layers, and of Cuttings; they delight in a moist Soil.

Apricocks, how raised.

*Apricocks* are usually inoculated in *Plum-stocks*, raised either from Suckers that have not been grafted before, or Stones; those of the *White Pear-Plum* are esteemed the best, and those of any other great *White* or *Red Plum* that hath large Leaves and Shoots are very good for the budding of *Apricocks* or *Peaches*: I have known some, both *Apricocks* and *Peaches*, bear very well that were only raised of Stones, but their Roots are reckoned very spongy, and so not apt to continue long. *Apricocks* do well also in Standards.

Peaches.

*Peaches* are of several sorts, and are raised the same way with *Apricocks*, and delight in the same Soil.

Nectarines.

*Nectarines* delight in the same Soil as *Apricocks* and *Peaches*; they are raised by Inoculation, the best Stock for which is that raised of the *Peach-Stone*.

Figs.

*Figs* are of several sorts, they are multiply'd of Suckers, and delight in a warm moist Soil.

Oranges and Lemons.

*Orange* and *Lemon Trees* are raised by sowing their Pippins or Seeds in Boxes, and when they are two years old transplant them in Cases, every one in a Case by it self filled with rich *Melon-bed* Mould mingled with Loam, refined and matured by one Winter Season; and when they can well support it, you may either inoculate or graft them by approach in the Spring of the Year. Be diligent to secure them from Cold, and commit them early to their shelter; where they may intirely be preserved from the Frost; you may give them a gentle Stow, and attemper the Air with a Fire of Charcoal



Charcoal during the extream rigour of the Winter, in case you suspect the Frost has at all invaded them.

But so soon as the Spring appears, and the Frosts are intirely past, you may acquaint them with the Air by degrees, beginning first to open the Doors of the Conservatory in the heat of the Day, and shutting them again at Night; and so by little and little you may set open the Windows and shut them again in the Evening till all danger is past, and then you may bring them forth and expose them boldly to the Air during all the Summer following.

As these Trees grow big you may change and enlarge their Cases, but be sure to take them out Earth and all, raising the stringy and fibrous Roots a little with a Knife before you replace them, supplying what their new Cases may want with the fore-described Mould. Some when they alter their Cases denude them of all the Earth, conceiving it exhausted and insipid, but it is to the extream prejudice of the Tree, and doth set it so far back that a year or two will hardly recover it.

You may gather the Flowers every Day to prevent their knotting into Fruit, sparing only some of the fairest and best placed for Fruit, and as many as you conceive the Tree can well nourish.

The Spiders do extreamly affect to spread their Toiles among the Branches and Leaves of this Tree, because the Flies so much frequent their Flowers and Leaves, which attract them with their Redolency and Juice; to remedy this, use such a Brush as is made to cleanse Pictures withall from Dust, but treat them tenderly.

Mr. *Hartlib* condemns us much for neglecting the propagation of *Almond-Trees*, which (saith he) grow very well and bear good Fruit, he having, as he says, seen divers Bushels on one Tree in his Brother's

Brother's Orchard; they grow large and upright, and need not the help of a Wall. The *Almonds* are in some sweet, and in others a little bitter; the Tree is chiefly received for the Beauty of its Flowers, which being early, and of a fair pale reddish Colour, make a fine show in a Garden.

They are raised by setting of the Nut in the Shell in the Month of *October*.

### Chap. VI. Of Dwarf, Wall and Standard Trees.

**Y**OUR Trees being grafted or inoculated on proper Stocks, the next thing to be consider'd, is which are to be for *Dwarfs*, *Walls* and *Standards*, that a proper method may be used about each sort, the ordering of which consists mostly in the pruning of them: *Dwarf Trees* must be pruned so as to make them hollow and to branch low into as many Branches as you can: The same care must be taken of such as are to plant against Walls; only as the one are to grow round, the others are as much as you can to be made to grow flat, that they may spread the better on the Wall; but for the *Standards*, as soon as you can, you are to reduce them to one Branch, which when it comes to the intended height you desire, you must cut the top of it to cause it to head at that place, always considering the strength of the Body, which if it have strength enough you may prune it clear up: but if weak, leave according to its strength more or less Branches to grow out of the sides, and check the Sap which strengthens the Body; and so will the pruning of the Head, when once the Body is of a good strength.

By this means being provided with all sorts of Trees, it will in the next place be convenient to consider the Methods to be used for the Planting of them  
out,

out, in doing of which it will be necessary to know, first, how to order the Ground, and secondly, how to transplant the Trees.

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*Chap. VII. Of the manner of cultivating Ground for an Orchard.*

**T**HE natural Soil of an *Orchard* is more to be regarded than that of a *Garden*, because the *Garden-Product* rooteth but shallow, and so may easily be manured to the depth that is required for *Garden-Commodities*; but *Fruit-Trees* growing large and rooting deep, ought to have a deep and rich Soil where your conveniency will allow of it.

And if the Land that you intend to plant be a Turf or Green-sward, you will do well to plow it two years before you set the Trees in it, to make it mellow and loose; and the deeper you plow it the better, because the Trees will have the better opportunity to root; and if you lay Dung or Manure on it, the plowing will mix it the better with the natural Soil, and it will be much the better to dig if you design to set Beans, Pease or other Commodities with your Trees, which is the best way of advancing the Growth of your Trees; and if you would have your Trees to thrive, you must take care that your Trees be not too near together, and that no sort of Plants be near them, which may deprive them of their Nourishment, or any way hinder those refreshings and helps that they might otherwise receive by the Rain or Dew.

Take care to keep the Earth about your Trees always light and clean, and often cultivated, so as to mend and clean it as often as it requires.

Earth that is hot and dry must be dug or tilled in Summer-time, either a little before or whilst it rains, or soon after; at which time you can nei-  
ther

ther till it too often nor too deep, because the doing of it in hot weather will kill such Herbs or Flowers as grow in it, except they are watered; but cold strong and moist Earth is best to be tilled in dry Weather, only there are some Grounds that will not work till Rain comes.

The frequent stirring of the Earth prevents its goodness from being wasted by the growth and nourishment of ill Plants; but such stirrings are not enough without pulling of the Weeds up: for ill Weeds that usually grow in Summer and Autumn multiply without end if they are suffered to run to seed. At the time that the Trees blossom and the Vines shoot, the Earth is not to be meddled with.

To dry Earth a large Culture or Tillage may be allowed the beginning of Winter, and the like, as soon as it is past, that the Snow and Rain of the Winter and Spring may easily sink into the Earth; but to strong and moist Earth a small Tillage in *October* only, to remove the Weeds, is best, and to give a large tillage in Spring when the greatest Rains are over.

But if your *Orchard* is situated in a sandy or dry Ground, endeavour by the help of some Gutters to carry off all the Water that falls in hasty Showers to those places that are manured, that none of it may be unprofitably wasted in the Walks or Allies; but if your Soil is strong and fat, drain it off from the *Orchard* as much as you can. And if your Land lie flat, that Wet is apt to stand upon it, or if 'tis a shallow Soil, you may something help it in plowing, by gathering of the Land always up in and near the place where you intend the rows of Trees shall afterwards stand; which will make the Soil deep where they are to stand, and draw off the Moisture, as was said before.

Rain.



Rain-Water sinks not so deep into Land as Snow, and therefore in moist Land it is a good way to remove the Snow as much as you can from about your Trees.

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### Chap. VIII. *Of the Transplanting of Trees.*

**I** Have already given several Directions for the Transplanting of *Forest-Trees*, which will serve for *Fruit-Trees*; also, and therefore what I shall consider about *Fruit-Trees* at present is the distance they are to be planted at, and what may tend to the making of them the more fruitful; the seldom bearing of Fruit being one of the greatest discouragements that attends Planting.

As for *Standards* of *Apples* or *Pears* I am not for planting of them nearer than forty Foot; which distance, if any one think too far for an *Orchard*, and that by the thriving of their Trees (especially while they are young) they shall sustain loss, I should rather advise them to plant *Cherry-Trees*, *Codlins*, *Plums*, &c. between, because in about thirty or forty years time they will be decaying, and so by cutting them down will make way for the other Trees, the largest of *Apple* and *Pear-Trees*, and the room that they have being what I think doth much contribute to their bearing and thriving, in that they receive the more benefit and refreshment of the Sun and Air, and have the more room for their roots to spread by their distance from each other, and the Fruit is much the better. But if you plant them in Fields or Pastures, fifty or sixty Foot distance will do well, because they will be less prejudicial to the Grass; but for the preventing of any Inconveniency that may come to Pasture-Lands from the dropping of the Trees, I shall propose one thing that I have already

ready hinted at, which is, to plant all your Trees in Rows from *East* to *West*. Let the Trees and Rows be forty Foot one from another, and let all the Trees, by pruning of them, be made to grow like a Fan, or to spread in the same form as if they were to grow against a Wall, only in that the Stem must be taller: This I think will prevent the prejudice that the dropping of Trees will do to the Grass, and will shade the Land from burning, and improve it by the falling of the Leaves, and will also cause the Fruit to ripen much better than if they grew in the common form; of which last Particular I have had the experience of two or three Trees that I kept trimmed after the same manner on purpose for a tryal.

*Cherries, Plums, Quinces*, and such like Trees, may be planted at fifteen or twenty Foot distance, which is sufficient.

It will be necessary at every three or four Years end to lay about aged Trees some Soil, especially Lime or Chalk, which is done by uncovering the Mould within a little of the Roots, and applying of it, and then covering of them again with Earth; the best season for which work is the beginning of Winter, that the Rains may wash it to the Roots before the heat of the Summer invades it.

*Wall-Trees.*

But *Wall-Trees* should be planted at such distances as the Height or Breadth of the Wall, the Nature of the Tree, and the Nature of the Ground requires; the higher the Wall the nearer the Trees may be together; and the lower the Wall the farther distance, that they may have room to spread in breadth where they want it in height; especially Vines, which require a more spacious and ample place to spread against than other Fruit, it being certain that the more they spread the better they bear and thrive, which is contrary to the Opinion of all Foreign Parts: And the same may be observed

served of most other Wall-Fruit, especially *Pears* and *Apricocks*, upon which account I cannot but think most of our Walls too low, and our Trees commonly planted too thick. And,

Having occasion to find fault with the common sort of Walls for Fruits, it gives me an opportunity of recommending the Proposal made by Mr. *Fatio* for sloping Walls, that so what is planted against them may lie exposed to the direct Beams of the Sun: This sort of Walls, breaking the Wind and reflecting the Sun-beams from one Wall to another, must be of great advantage for the ripening of Fruit in our cold Climate; to which I shall only add an accidental Experiment made by a Friend of mine, who had a Wall, the Foundation of which being bad obliged him on the planted side, between each Tree, to make Butteresses of about a Yard from the Wall, which caused his Fruit to ripen much sooner than it did before: his Wall stood a little facing to the *Eastward* of the *South*.

But to proceed to what I think the great Point to be taken care of about *Fruit-Trees*, which is the Unfruitfulness of them, it being often many Years together, that both *Apples*, *Pears* and other Fruits fail, as we have of late experienced for seven or eight Years together; which Inconveniency being one of the greatest discouragements that attends Planting, as I said before, it may not be amiss a little to consider the occasion of this Unfruitfulness, and likewise to propose some Remedies for the same. Now the Unfruitfulness of these Trees commonly proceeds,

*First*, From Blasts occasioned by the Winds, as many times from the *East-wind* in the Spring, which coming after Rain, when the Blossoms are wet, and bringing of Frosts with it, shrivels up the Leaves of the Blossoms and spoils them. If a *West-wind*

*Walls for Fruit.*

*Of the Unfruitfulness of Trees.*

*Occasioned by Blasts*



*West-wind* succeeds it commonly brings Catterpillars; the best Remedies against which are good Shelter, to prevent the Frosts; and the burning of Straw, Hawm, &c. to kill the other, but a great means to have Fruit all Years, is where you have the Conveniency of different Situations; that so when a Blast comes by one Wind, you may have another under shelter from it; and tho' the *South Aspect* is the best for ripening of Fruit, yet the most constant bearing Orchard that I have met with, is an Orchard belonging to a small Farm I have in *Hertfordshire* that is not above a Rood of Ground which is situated on the side of an Hill that faces the *North-East*: the Soil is a kind of a yellow Tile-Clay, and the *West* end of it is sheltered by the House, and the *South* side by high Trees, but the *North* side and *East* end is wholly exposed to those Winds. But having a conveniency of several Situations where I now live, I may, when the Trees grow up which I have lately planted, be able to give a better account of this Particular; for experiments of this kind must rather be try'd in the *South* parts of *England* than *North*, especially for *North* or *West* Situations.

*Want of Rain.* Secondly, The want of Rain just at Blossoming-time often occasions the dropping off of the Blossoms for want of Sap to nourish them, especially in dry Grounds; and therefore I have heard of some in *Essex*, whose Orchards were upon a dry Soil, that have had great quantities of Fruit when all their Neighbours about them have failed, only upon this account, that they keep their Trees watered at Blossoming-time; and of a Gentleman who had an Orchard planted on the side of a Hill that he could water when he would, which hardly ever failed.

*Suiting Fruit  
to the Soil.*

The *third* occasion of Unfruitfulness is the not suiting of your Fruit and Soil together, a Point that



that deserves more particular Observations than I have been yet able to make, and what I would desire the Assistance of such in as are willing to promote this Work, being satisfied that not only some sort of Fruits bear better on some Soils than others, but also that they thrive much better; however in the mean time I shall advise them that plant an *Orchard*, to enquire what sort of Soil their Neighbours *Orchards* are of, and what sort of Fruits bear best in those Soils, and accordingly to stock themselves with that sort of Fruit.

But a great hindrance to a due enquiry into this useful part of Husbandry is the variety of Names that are in many places given to one and the same *Apple* or *Pear*, and therefore where any one hath a good bearing Fruit, I would advise them to be sure of the Name of them from some experienced Gardiners, and then a certain Judgment may be made of them. And if you find the Ground wherein you plant your Fruit-trees not suitable to the Nature of the Tree, it may be altered by applying of Earth, Clay or Sand of a different Nature to your Soil.

A *fourth* Reason of the Unfruitfulness of Fruit-trees is the Barrenness of the Soil they are planted on, for I cannot but think it as necessary to dung *Orchards* as Plowed Lands; that so the Dung may wash to the Roots of the Trees to nourish them; this I reckon was the reason of the fruitfulness of the *Orchard* mentioned by Mr. *Hartlib* in his *Legacy*, when he advised the turning of the Wash of a Sheep-common to the Roots of the Trees, which, he says, occasioned such a fruitfulness to an *Orchard* that belonged to a Farm that an Acquaintance of his held, that the Occupier got an Estate out of the Farm by it, which before was so dear rented that it had likely to have ru-

*From barrenness of the Soil*

ined him. And I knew a Farmer in *Kent* that used to say, that he had often observ'd it, that whenever he let his Hogs go into his *Orchard* un-rung, to root about the Trees and to dung them, he had always a Crop of Fruit; and it is certain, for Fruit-trees no Dung is so good as Hogs-dung, which Mr. *Worlidge* confirms in his *Vinetum Britannicum*; and tho' they may spoil some Grass in Winter, it is easily levelled in Spring. Hogs-dung is likewise an excellent Medicine for a Canker.

From Moss.

*Fifthly*, Moss is very prejudicial to the bearing of *Fruit-trees*; and is commonly occasioned by the coldness of the Land the Trees grow on, whether it is wet or dry, or their being planted too deep; and if it proceed from the coldness of the Land, lay Sea-coal-ashes, Horse-dung, &c. If from Moisture, drain the Land well; but if it proceed from deep planting, if they are small, it is the best way in very moist Weather to draw them up higher; but if they are too large, for that there is no remedy but replanting of them, or to plant new in their places. To cure the Moss in *Staffordshire*, I am told, they burn off the Moss of their Trees about *December* with a wisp of Straw; but the common way is, to rub it off of young Trees with a Hair-Cloth, or to scrape it off with a wooden Instrument that may not hurt the Bark of the Trees. I knew one that had an *Apple-tree* very much run over with Moss, and he made a Sty under it in which he fattened Hogs, and it cured it. But as Moss is sometimes caused from the want of Sap, which is the reason that old Trees are commonly more Mossy than young, it is good to lop off several of the Branches of such Trees, which will make them prosper the better, and be less Mossy; especially where Trees are Mossy that grow on dry Ground.

*Sixthly*,

*Sixthly*, Many Trees run altogether to Wood and Branches, and seldom bear any Fruit; to remedy which Inconveniency some propose hacking of the Tree, or to cut Crosses or other Stroaks upon the Bark to give some check to the Sap; others propose to bore a Hole through the Body of the Tree; this way carries some probability with it, because hollow Trees, or such as are hurt or decay'd in the Body or Stem are more apt to bear than sound ones. The same reason may be for the cleaving of the Roots of Trees, and for the putting of Stones or Wedges in them; for Trees blown aside by the Wind, or by some other accident, do usually bear great quantities, and sometimes more than when they stood firm and upright: the reason of which may be the Check that is thereby given to the Sap running into the Branches, when less Sap might do to produce Fruit.

*Seventhly*, It is good to have variety of Fruit in an Orchard, because some *Apples* and *Pears* that bear in one Year will not do so in another; and therefore where Variety is, you will seldom fail of having some take. *Variety good.*

*Eighthly*, Another thing to be consider'd, is, to plant such Fruit as will hang on the Trees till ripe, there being many sorts of Fruit that will shake off almost with any Wind; upon which account it is good always to have the *S. W.* side of your Orchard well shelter'd with high Trees, that Wind being, as I said before, the most troublesome about the latter end of Summer. *To plant Fruit that will hang on the Trees.*

I shall here add something concerning the fencing of Trees out of Mr *Evelyn*, communicated unto him from Dr. *Beal*, which will be of advantage to the planting of Trees in Fields for securing of them from Cattel.

The fencing of single Trees useth to be done by Rails at great Charges, or by Hedges and Bushes, *which*

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which every other Year must be renewed, and the Materials not to be had in all places neither; I therefore prefer and commend to you the ensuing form of Planting and Fencing, which is more cheap and easie, and hath other advantages in it not commonly known: I never saw it but once, and that imperfectly performed, but have practised it my self with success. Take it thus,

Set your Tree on the green Swarth, or rather five or six Inches under it, if the Soil be very healthy; if moist or weeping half a foot above it: then cut a Trench round that Tree two Foot or more in the clear from it. Lay a rank of the Turfs, with the Grass outward, upon the inner side of the Trench toward your Plant, and then a second rank upon your former, and so a third and fourth, all orderly placed (as in a Fortification) and leaning towards the Tree after the form of a Pyramid or larger Hop-hill: Always as you place a row of Turfs in compass, you must fill up the inner part of the Circle with the loose Earth of the second Spit which you dig out of your Trench, and which is to be two foot and half wide, or more, as you design to mount the Hillock; which by this means you will have raised about your Plant near three foot in height. At the Point it needs not be above two Foot or eighteen Inches diameter, where you may leave the Earth in form of a Dish, to convey the Rain towards the Body of the Tree, and upon the top of this Hillock prick up five or six small Briars or Thorns, binding them lightly to the Body of the Plant, and so you have finished the Work.

The Conveniences of this kind of Planting are,  
*First*, that neither Swine, nor Sheep, nor any other sort of Cattel can annoy your Trees.

*Secondly*, You may adventure to set the smaller Plants, being thus raised and secured from the reach of Cattel.

*Thirdly*,



*Thirdly*, Your Trees are fastened in the Hillock against the violence of Winds without Stakes to fret and canker them.

*Fourthly*, If the Soil be wet, it is hereby made healthy.

*Fifthly*, If very dry, the Hillock defends them from the outward Heat.

*Sixthly*, It prevents the Couch-grass, which for the first Years insensibly robs most Plants in sandy Grounds apt to Graze. And,

*Lastly*, The grazing Bank will recompence the niggardly Farmer for the wast of his Ditch, which otherwise he will sorely bethink.

In the second or third Year (by what time your Roots spread) the Trench, if the Ground be moist or Season wet, will be near filled up again by the treading of Cattel, for it needs not be cleansed; but then you must renew your Thorns: Yet if the Planter be curious, I should advise a casting of some small quantity of rich Mould into the bottom of the Trench the second Year, which may improve the growth, and invite the Roots to spread.

In this manner of Planting where the Soil is not rich, the exact Planter should add a little quantity to each Root of Earth from a frequented Highway or Yard where Cattel are kept. One Load will suffice for six or seven Trees, this being much more proper than rotten Soil or loose Earth, the fat Mould best agreeing with the *Apple-Tree*.

The broader and deeper your Ditch is, the higher will be your Bank, and the securer your Fence; but then you must add some good Earth in the second Year, as before.

I must subjoyn, that only Trees of an upright growth be thus planted in open Grounds, because spreading Trees will be still within reach of Cattel as they encrease. Nor have I met with any

Inconvenience in this kind of Transplanting (which is applicable to all sorts of Trees) but that the Mole and the Ant may find ready Entertainment the first Year, and sometimes impair a weak rooted Plant, otherwise it rarely miscarries. In summ,

This manner of Fencing is soon executed by an indifferent Workman, who will easily set and guard six Trees in a Winter's Day.

I shall conclude this Point with giving a short account of some of the best or most common sorts of *Apples*, *Pears*, and other Fruits that I have met with, with some Remarks upon the several sorts, in order to procure a more exact account of them, which is a work that will need more assistance exactly to perform than I am able to procure at present, every Country, and many parts of each Country, having some sort of Fruit or other not known in the next; and therefore in the mean time the Rule that I shall advise most to observe is, to take an account of the best Bearers and most useful sorts of Fruits, and the particular Soils that they thrive and bear best in.

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Chap. IX. *A Catalogue of Fruits, &c.*

THE *Aromatick* or *Golden-Russetting* hath no compare, it being of a Gold-coloured Coat under a Russet Hair, hath some Warts on it, its Flesh of a yellow colour, its form of a flattish round. This Fruit is not ripe till after *Michaelmas*, but keeps over the Winter; and is, without dispute, the most pleasant tasted *Apple* that grows, having a most delicate *Aromatick* Relish, and melting in the Mouth.

The *Orange-Apple*, so called from its likeness in colour and form to an *Orange*, deserves the next place,

place, having a fine rough Gold-coloured Coat, resembling the *Golden-Pippin*, only fairer, keeps long, and is of a very pleasant tast.

The *Golden-Pippin* is smaller than the *Orange-Apple*, else much like it in colour, taste and long keeping, being the best of all *Apples* for Cyder, Eating, and Baking.

The *Russet Pearmain* is a very pleasant Fruit, continuing long on the Tree and in the Conser-vatory, partakes both of the *Russetting* and *Pearmain* in colour and tast, the one side being generally *Russet*, and the other streaked like a *Pearmain*.

The *Pearmain*, whereof there are several sorts, is so excellent an *Apple*, and so well known, that no more need be said of it; only the larger sort keeps not so well, neither is the *Summer Pearmain* so good as the *Winter*; they are all good Cyder-Apples, but no great Bearers.

*Pippins* are of several sorts and take their Name from the small spots or pips that usually appear on the sides of them. Some are called *Stone-Pippins* from their obdurateness; some are called *Kentish-Pippins*, because they are a Fruit that agrees well with that Soil; others are called *French Pippins*, having their original from *France*; which is the best bearer of any of these sorts of *Pippins*, the *Holland-Pippin* from the same cause, and the *Russet-Pippin* from its Russet hue, with divers others denominated from the several places of their growth, but such as are distinguished by the Names of *Grey* and *White Pippins*, are of equal goodness. They are generally a very pleasant Fruit and of a good Juice, fit for the Table, Conser-vatory or Kitchen, but they are slender bearers.

The *Golden-Rennet* is a very pleasant and fair Fruit, of a yellow Flesh, and the best of bearers for all sorts of Soil, of which there are two sorts, the large sort and the small; the smallest keeps

the best, and is the best flavour'd, but the other is a mealy Apple if kept after *November*, and neither of them good Cyder-Apples alone; but Mr. *Worlidge* commends them if mix'd with the *Red-streak*. They sell well in the Market, and are good eating Apples during the first part of *Winter*.

We have in *Essex* an Apple called a *Snow-Apple*, which is an extraordinary certain bearer on the light brick Earths, but a very ordinary Apple of its kind; yet for its constant bearing I cannot but value it, for I had rather have any indifferent Apples, than none at all.

There is also in *Hertfordshire* an Apple much resembling a *Gennet-Moil*, which they call a *Wiltshire*; it is both a good bearer and a good Cyder-Apple.

The *Leather-coat* or *Golden-Russetting*, as some call it, is a very good Winter Fruit, lasts long, and is of a good, firm and yellow Flesh.

The *Green Russetting* is a tough and hard Fruit that lasts long.

The *Red Russetting* is of a lesser size, long lasting, and are all of them of a pleasant relish.

The *Sharp Russetting* is an extraordinary bearer, and a good Cyder and keeping Apple.

The *John-Apple* or *Deux-Ans*, so called from its continuing two Years before it perisheth, is a good relished sharp Apple the Spring following, when most other Fruit is spent, they are fit for the Cyder Plantations being great bearers, and tho' dry Fruit they yield very good Juice, but must be ground before *January*. There is a *Summer John-Apple*, that is very much commended also.

The *Marygold-Apple*, so called from its being marked in even Stripes in the Form of a *Marygold*; sometimes the *Onion-Apple*, from the reddish brown



brown colour resembling a well-colour'd Onion ; sometimes called the *Kate-apple*, and sometimes *John's Pearmain* from its likeness to a *Pearmain*, is a very good Fruit, long lasting, and fit for the Table, Conservatory, Kitchen or Press, yielding a very good Juice ; it bears every other Year even to admiration : There is another sort of them called *Summer Marygolds*.

The *Harvey Apple* and the round *Russet Harvey* are very pleasant Fruit and good Cyder-Apples, but are no good bearers.

The *Queen Apple* ; those that are of the Summer kind, are good Cyder-Apples mix'd with others, being of themselves sweet : The *Winter Queening* is good for the Table.

The *Paradise Apple* is a curious Fruit produced by grafting a *Pearmain* on a *Quince*.

The *Pome-Roy* is a Fruit of a good tast, a pulpy substance, but not yielding much Juice.

The *Pome-water* is an indifferent good lasting Fruit.

The *Golden Douset* or *Golden Ducket* is much commended.

The *Westbury Apple* taking its Name from *Westbury* in *Hampshire*, from whence they are much dispersed into the adjacent parts, is, as Mr. *Worlidge* says, one of the most solid Apples that grows, of a rough Rind and obdurate Flesh, sharp and quick taste, lasts long, and yields a very excellent and plentiful Juice, making Cyder equal to the best of Fruits ; and for the Kitchen, few or none exceed it.

The *Gillyflower Apple* is of a pleasant relish and long lasting, of a thick Rind, hard Core, striped, and a good Cyder-Apple, making an excellent mixture.

The *Margaret Apple* is the best and most early, usually ripe about St. *Margaret's* Day in *June* ; it is

is a fair and beautiful Fruit, of a pleasant tast and scent, and deserves a more general propagation.

The *Fenneting* is next to be esteemed, as well for its early ripening as its pleasant tast.

The *Devonshire Quarrington* is also a very fine early Apple.

The *Summer Pippin* is a very pleasant Apple in colour and tast, yielding a delicate Juice.

The *Creeper* is an Apple so called from the Tree, which grows low, and traileth its Branches near the Ground.

The *Ladies Apple* is very beautiful, and begins to be good about *December*, and lasts till *March* and *April*; it is a great bearer, and never wrinkles with keeping.

The *Ladies Thigh* is a kind of a *Russetting* in shape and colour, with a very juicy and tender Pulp, a little musk'd; its Tree is very long before it bears, but afterwards produces abundance, and is ripe the beginning of *July*.

The *Violet Apple* is of a whitish ground Colour, a little speckled in those parts that are from the Sun, but striped with a deep Red on the Sunny side; the Pulp is very fine and delicate, and is to be eaten as soon as gathered, tho' it will continue good till *Christmas*.

The *Codling*, so called from the use it is put unto, makes a good Summer Cyder, and is a good bearer either in Hedges or Standards.

The *Claret Wine Apple* is fair and yields plenty, of a pleasant sharp Juice, from which it takes its Name; being well ordered it excells most other Cyders, especially with a mixture of sweet Apples.

The *White Wining* is a small white Apple and a good bearer, the Fruit juicy and pleasant, but soon perishing, and the Cyder made thereof small.

The *King Apple*, tho' not common, yet is by some esteemed an excellent Apple, and preferr'd before the *Fenneting*.

The

The *Famagusta* is also in the number of the best of early Apples.

The *Giant Apple* is a large Fruit well tasted and the best of any Summer Apple for the Kitchen.

The *Bontra-due* or *Good House-wife* is the largest of Apples, a great bearer, good for the Kitchen. It makes good Summer Cyder.

The *Cat's-head*, by some called the *Go-no-further*, is a very large Apple, and a good bearer.

The *Spicing Apple*, of all Apples that are marked Red is the meanest.

The *Gennet Moil* is a pleasant and necessary Fruit in the Kitchen, and one of the best Cyder-Apples, and a good bearer.

The *White Must* is a very pleasant Apple, yielding great plenty of Vinous Liquor, bearing this Name in *Herefordshire*, and is thought by some to be the same with the *Golden Rennet* in *Hampshire*.

The *Red Must* is also of the same nature.

The *Fox Whelp* is esteemed among the choice Cyder-Fruits.

The *Bromsbury Crab*, altho' little better than the common, yet kept on heaps till *Christmas* yields a brisk excellent Cyder and very strong.

*Eleots* are Apples much in request in the Cyder Countries for their excellent Liquor, but not known by that Name in several parts of *England*.

The *Stocken* or *Stoken Apple* is likewise in esteem there, altho' not known by that name in many places.

The *Bitter Scale* is an Apple much esteemed of in *Devonshire* for the excellent Cyder it yields without the mixture or assistance of any other.

The *Deans Apple* is there well esteemed of for the same reason.

As also is the *Pleasantine*, perhaps the same with our *Mary-gold*.

The *Pureling*. Its Name is not usual, but in the same Parts.

The

The *Underleaf*, whose Cyder is best at two Years; 'tis a very plentiful bearer, hath a Rhenish Wine flavour, the very best of all Cyders of this kind; the Apples should be hoarded a little within Doors; and the longer you would keep your Cyder, the longer you must hoard your Fruit.

A long pale Apple called the *Coleing* about *Ludlow* is an extraordinary bearer.

The *Arier Apple*, a constant bearer, making a strong and lasting Cyder; some call them *Richards*, some *Grange Apples*; and indeed they make so excellent a Drink that they are worthy to be recovered into use.

The *Olive*, well known about *Ludlow*, may, I conceive, be accounted among the Winter Cyder-Apples, of which it is the constant report, says Mr. *Evelyn*, that an Hogshead of the Fruit will yield an Hogshead of Cyder.

*Fillets*, whereof also there are the *Summer* and the *Winter*, in very high esteem for the delicate Vinous Liquor they yield. The *Summer Fillet* for the present, and the *Winter Fillet* for lasting Cyder.

The *Red-streak* of all Cyder-Fruit hath obtained the preference, being but a kind of Wilding, and tho' kept long yet is never pleasing to the Palate; there are several sorts of them, the *Summer* and the *Winter*, the *Yellow* and the *Red*, and the more green *Red-streak*: Some sorts of them have red Veins running thro' the whole Body of the Fruit, which is esteem'd to give the Cyder made thereof the richest Tincture if they are kept till mellow; the Cyder at first is very luscious, but if ground more early, it is more racy.

The *Quince Apple*, so called from its Colour, is a good Table-Fruit as well as Cyder-Apple.

The *Nonsuch* is a long lasting Fruit.

The *Angel's Bit* is a delicate Apple for tast, and the Tree or its Name proper to *Worcestershire* and those parts.

The



The *Peeling* is a lasting Apple, makes very good Cyder, agrees well with this Air, and is a good bearer.

The *Oaken-pin*, so called from its hardness, is a lasting Fruit, yields excellent Liquor, and is near the nature of the *Westbury Apple*, tho' not in form.

The *Greening* is of a colour green and keeps to a second Year, and is a good Apple.

The *Lording* is a fair green and sharp Apple, a constant bearer, being a hardy Fruit, for the Kitchen only.

*Sweet Apples* there are of several sorts, and their Names change in every place, so that they are rather known by their Colour and Size than their Names; there is one called the *Honey-comb* in some places, which is a fair Apple, and mix'd with other Fruit makes admirable Cyder; so doth the *Small Russet sweet Apple*, whose Tree is always Canker.

*Pome-apease* is an Apple newly propagated; the Fruit is small and pleasant, and yields no unpleasant Scent; the Tree is a good bearer, and it is supposed that this is that which is called the *Lady's Longing*.

The *Fig-apple* is also newly propagated, the Tree yielding no Blossoms as is usual with other Apple Trees, nor hath the Fruit in it any Core or Kernel, in these resembling a Fig, and differing from other Apples, yet is a good Table Fruit and lasting.

The *Sodom Apple* or *Bloody Pippin* is a Fruit of more than ordinary dark colour, and is esteem'd a good Apple.

The *Muscovy Apple* is a good Winter Fruit and a great Curiosity, for that it is transparent.

*Belle* and *Bon* are of two sorts, the *Summer* and *Winter*; it is a fair Apple and a good bearer, but the Fruit not long lasting; it makes indifferent Cyder;

Cyder; the *Winter Belle Bon* is much to be preferred to the *Summer* in every respect.

The *Pear Apple* is a curious pleasant Apple of a rough Coat, but is no good bearer.

There are also the Apples called *Esquire Vernon's Apple*, the *Grutch-ling*, the *Pear Russet*, the *Stoak Apple*, the *Suffolk Apple*, which are much commended for the Table and Kitchen.

The *Pell-Mell Apple*, the *Thrift Apple*, and the *Winter Glory* are very good lasting Apples.

*Crabs* when kept till they are mellow may be reckoned amongst Apples, and being ground with other mellow Fruit do much enrich the Cyder, and is the best refiner of foul Cyder.

The *Castard Parsley Apple*, the *William*, the *Cardinal*, the *Short-start*, the *Winter Red*, the *Chestnut Apple*, and the *Great Belly*, are in many places Apples of esteem, but being not acquainted with them I can only name them. Many more there are both *French* and *English*, which either are not made familiar to us, or else are peculiar only to some places, or their Names changed in most Counties, or else are of small account, which to enumerate would be tedious and useless.

## Chap. X. Of Pears.

THE next in esteem are *Pears*, so called from their Pyramidical form, whereof there are so great variety, that the Kitchen and Table may be furnished throughout the Year with different Species.

The *Early Susan* is the first ripe, being a small round Pear little bigger than a large Cherry, the Colour is green, and the Taste pleasant.

The *Margaret*, the *Maudlin*, the *Cluster Pear*, the *Lenthal Primet*, the *Sugar*, the *Madera*, the *Green*

*Green Royal*, *July Pear*, *St. Laurence*, *Green Chesil*, and many other early Pears are in esteem for the Table in July; but after them you have

The *Windsor*, the *Green-field*, the *Summer Burgamot*, the *Orange*, the *Sovereign*, several sorts of *Katharines*, whereof the *Red Katharine* is the best, the *Denny Pear*, *Prussia Pear*, *Summer Popperin*, *Lording Pear*, *Summer Bon Chrestien*, the *Orange Burgamot*, *Hampden's Burgamot*, *Bezy de Hery*; the *Violet Pear*, the *Painted Pear*, so called from its delicate strip'd Colours; the *Rosewater Pear*, the *Shortneck*, so called from the shortness of its Form and Tail; the *Binfield*, or *Dove Pear*, the great *Muck Pear*, the great *Russet of Remes*, *Amadotte*; the *Roufelet Norwich Pear*, the *Pomegranate Pear*, so called from its shape, and the *Edward Pear* very pleasant; the *Meola ala Busk*, *Crown Pear*, *St. Michael's Pear*, *Carlisle Pear*, *Roshea*, esteemed an extraordinary Pear, *King Katharine*, *Roufelet Petit*, *Roufelet Hasliffe*, *Musk Blanquet*, *Dove*, *Musk Burgamot*, *Queen Pear*, *White Robert* and the *Desirable Pear*, are all very good Table-Fruit for their Season before or at *Michaelmas*.

The *Bævre du Roy* is esteemed for the Table the best of all Summer Pears; 'tis a fair brown Pear and excellent in its Season, melting in the Mouth, and thence called the *Butter Pear*, and bears well against a Wall. The green *Bævre Pear* is more green and larger than the former.

The *Lewis Pear*, or by some the *Maiden-heart*, is a very good bearer, and the best of all Pears to dry.

The *Bloody Pear* is a good Pear, taking its Name from the Red Juice it hath within its Skin, and is a very great Curiosity.

The *English Warden*, the *French Warden*, and the great *Spanish Warden*, the *White Warden*, the *Stone Pear*, the *Arundel Pear*, the *Bishop's Pear*, the *Caw Pear*, *Winter Musk Cashurine*, the *Lady-Hatton's Pear*,  
the

the *Quince Pear*, the *Davis Pear*, *Malborne Pear*, the *Red Roman Warden*, the *Green-Warden* and *Winter Norwich* are excellent Baking Pears.

The great black Pear of *Worcester* or *Perkinson's Warden* bears well against a Wall, they usually weighing twenty ounces or more, and being twice baked with Sugar exceed most Fruits.

The *Diego Pear*, *Monsieur John*, the *Gillyflower Pear*, *Pear Royal*, *Bowden Musk*, *French Violet*, *Mogul Pear*, *Virgo*, *Lair*, *Sovereign Pear*, *Okenbury Pear*, the *White Worcester Rouselet-durine*, *Montpelier Imperial Pear*, *Pear de Lyons*, a rare Winter Pear for the Table; the *Burgamot Bougee*, *Rowling Pear*, *Balsam Pear*, *Bluster Pear*, *Emperour's Pear*, *Queen-hedge Pear*, *Frith Pear*, *Brunswick Pear*, *Bing's Pear*, *Winter Poppering*, *Thorn Pear*; the *Portail*, the *Non-such Dioniere*, *Winter Katharine*, *Clove Pear*, *Lambert Pear*, *Russet Pear*, *Saffron Pear*, the *Petworth Pear*, or *Winter Windsor*, *Winter Burgamot*, *Pound Pear* and *Hundred Pound Pear*, *Long Burgamot*, *Burnt-cat*, *Lady Pear*, *Ice Pear*, *Dead-mans Pear*, *Bell Pear*, the *Squib Pear*, *Spindle Pear*, *Dogoniere*, *Virgin*, *Gascoign Burgamot*, *Scarlet Pear*, and *Stopple Pear*, all are very good Winter Pears, and keep throughout the old Year.

Pears that usually keep until the succeeding Spring are the *Bon Chrestien*, the best of Winter Pears; the great *Surrein* or *Serene*, *Little Dagobert*, the *Double Blossom Pear*, the longest liver of all, and takes very well in the Spring; the *Oak Pear*, the great *Kairville*, the little *Black Pear* of *Worcester*.

Pears that are esteemed for their Vinous Juice in making of Perry in *Worcestershire* and those adjacent Parts, are the *Red and Green Squash Pears*, the *John Pear*, the green *Harpary*, the *Drake Pear*, the *Mary Pear*, the *Lullam Pear*; but above the rest are esteemed the *Bosbury* and the *Bareland Pears*, the *White and Red Horse-pears*, and above all, that  
which



which is most commended is the *Turgovian Pear* mentioned by Mr. Evelyn.

When I lived in *Hertfordshire* a poor Man brought me three or four Bushels of small Pears, which were very small, hardly so big as the smallest Crabs, having something of a muskish flavour, tho' with it so rough a taste that the Hogs would hardly eat them; which made me think them a good Perry Pear, and accordingly I made Perry of them, which was so rough the first Year that no body would drink it: but I found that as the roughness wore off, the fine flavour increased, so that at four Years of age it had the colour of Canary and was as strong, and had as fine a flavour, being valued by all that tasted it before it; but the Man that brought them me dying before I knew the excellency of my Liquor, I could not be so certain of the Pear as I might if I had had his directions, there being three or four Trees cut down in the Field where he gathered them. Since, I got some Grafts of a Pear just like it for shape and Taste, which I believe to be the same; but the Trees I have raised being not yet big enough to furnish me with *Pears* to make the trial of their Juice, I cannot be positive of it till they do, which I mention only to advise others to more caution when they meet with any rarity of this kind.

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### Chap. XI. *Of Cherries.*

**I**N the next place the *Cherry* is admitted to be a Fruit of general Use, especially for the Palate and for the Conservatory. They are ripe on the Trees but three Summer Months, *May, June, July*, afterwards to be had only in the Conservatory.

In *May* the *Cherries* then ripe are usually so called from the Name of the Month, the *Duke* and

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*Arch-duke,*

*Arch-duke*, against a good Wall, are most Years ripe before the end of this Month.

In June are ripe the *White*, *Red*, *Black* and *Bleeding Hearts*, *Lukeward* one of the best of *Cherries*, the *Early Flanders*, the *Cluster Cherry* bearing three, four or five usually on a Stalk, the *White Spanish Cherry*, the *Amber Cherry*, the *Black Orleans*, the *White Orleans*, *Nonsuch*, the *Spanish Black* and the *Naples*.

In July usually succeed the late *Flanders*, commonly called *English Cherries*, *Carnations*, a delicate Fruit for the Table or Conservatory; *Morella* or the *Great Bearer*, being a *Black Cherry* fit for the Conservatory before it be through ripe, but 'tis bitter eaten raw, only it is to be esteemed being the last *Cherry* that hangs on the Tree, the *Morocco Cherry*, *Great Amber*, the *Egriot*, *Bigarreaux*, the *Prince Royal*, the *Portugal Cherry*, the *Kings Cherry*, the *Crown Cherry* and the *Biquar*, both ill Bearers, the *Great Purple Cherry* one of the best and latest *Cherries*, and a good Bearer, the *Ounce Cherry*, so called from its fairness, the *Dwarf Cherry*, so called from the smallness of its Twigs and Fruit; there is also the common *Black Cherry* much in esteem for its Physical Properties.

## Chap. XII. Of Plums.

THERE is great variety of *Plums*, and they are also appropriated to several Uses; they continue longer on the Trees than *Cherries*, and are a more pleasing, but not so wholesome a Fruit.

The first ripe are the *Red Blue* and *Amber Primordian Plum*, the *Violet*, *Red*, *Blue* and *Amber*, the *Matchless*, the *Black Damascen*, the *Morocco*, the *Barbary*, the *Myrobalan*, the *Apricot Plum*, a delicate *Plum* that parts clean from the Stone, the  
Cinnamon

*Cinnamon Plum*, the *Kings Plum*, the *Spanish*, the *Lady Elizabeth's Plum*, the *Great Mogul* and the *Tawny Plum*.

After them are the *White*, *Red* and *Black Pear Plums*, the two former little worth, but the *Black* a pleasant Fruit, the *Green Osterly Plum*, the *Musfel Plum*, one of the best of *Plums*, the *Catalonia Plum* much like the former, the *White Prunella*, the *Black Prunella*, the *Bonum Magnum* a fair yellowish *Green Plum*, excellent for the Kitchen and Conservatory, the *Wheaten Plum*, the *Laurence Plum* an ill tasted Fruit, the *Bole Plum*, the *Cheston Plum*, the *Queen-Mother Plum* one of the best sort, the *Diapered Plum*, the *Marbled Plum*, and the *Blue Marbled*, the *Damasco Plum*, the *Foderingham Plum*, the *Blue* and *Green Pedrigo* and the *White* not so good a Fruit, the *Verdoch* good only to Preserve, the *Peach Plum*, the *Imperial Plum* one of the largest of *Plums*, the *Giant Plum*, the *Denny Plum*, the *Turkey Plum*, the *Red*, *White* and *Green Peasecod Plums*, the *White*, *Yellow* and *Red Date Plums*, the *Nutmeg Plum*, the *Great Antony*, the *June Plum*, the *Prince Plum* the last ripe and good for several Uses. Many other sorts of *Plums* there are whose Names are uncertain, and are therefore here omitted.

There are several other sorts of *Plums*, as the *Friars Plum*, *Becket Plum*, *Crystal Plum*, *White Mussel*, *White Prunella*, *French White Nutmeg Catholick Plum*, *Turkey Plum*, *Amber Plum*, and the *Grass Plum*, all of them curious and well tasted Fruits.

There are two sorts of *Damascens*, the *Black* which is the most useful and best of all *Plums*; and the *White* which is not so good as the *Red*: these are natural to our *English Soil*, as are the *White* and *Black Bullace*, whereof the *White* are pleasant in *October* and *November*, and the *Black* necessary for the Kitchen in *December*, they usually hanging on the Trees till *Christmas*.

### Chap. XIII. Of Apricots, Peaches, Malacotunes and Nectarines.

THE *Apricots* so called from *Apricus*, delighting in the Sun, is a kind of *Plum*, but far exceeding any of the former in every respect; whereof

The *Algier Apricot* is early ripe; it is a small round and yellow Fruit ripe in June.

The *Masculine Apricot* is a better and earlier Fruit than the former, but not so good a bearer.

The long *White* and *Orange Apricot* differ from the common *Apricot*, as their Names tell you; there is also the *Turkey Apricot*.

The *Green Roman Apricot* is the largest of all the kinds, and therefore best for the Kitchen and Conservatory.

### Chap. XIV. Of Peaches.

PEACHES from the *French* Name *Pesche* are of longer continuance than *Apricots*, and of a more rich, noble Gust and Flavour.

The most early are the *Nutmeg* both *White* and *Red*, the *Troy Peach*, next the *Savoy Peach*, *Isabella*, *Persian*, the *White Monsieur*, *Newington Bellice Peach* to be preferred to the former, the *Queen Peach*, the *Magdalen Peach*, and the *Double Blossom Peach*.

After these come the *Rambouillet*, the *Musk Peach*, and the *Violet Musk*, both usually esteemed the best of *Peaches*, the *Crown Peach*, the *Roman Peach*, *Man Peach*, *Quince Peach*, *Grand Carnation Portugal Peach*, *Bourdeaux Peach*, late *Newington Des Pot* being spotted, *Verona*, *Smyrna*, *Pavia Peach*, and the *Coleraine Peach*; one of the latest is the *Biody Monsieur* an excellent *Peach*, very Red within and without.

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The *Modena*, *Orleans*, *Red Peach*, *Morello Peach*, *Navarra* and *Alberges* are very good Fruit and come clean from the Stone.

There are several other sorts of *Peaches*, as the *Arundel*, the *Admirable*, the *Sion Peach*, the *Uvedale Peach*, the *Superintendant*, the *Eaton Peach*, the *Laurence Peach*, the *Mountaban*, the *Persick*, the *Minion*, the *Perprice*, the *Supreme Peach*, and the *Arabian Peach*, all of them very curious Fruit. But the *Ricket Peach* hath lately gained the Reputation of being the best of *Peaches*.

Of *Malacotounes*, as much as to say, *Apples* with Cotton on them; there are two or three sorts, but being late ripe and old Fruit they are not much valued.

*Nectarines*, of the flavour and taste of *Nectar*, are very pleasant Fruit, whereof the *Red Roman* is the fairest, and by most esteemed the best and most delicate Fruit for its gust that this Island yields: by some the *Muroy* is preferred, by others the *Tawny*, neither of them so large as the *Red Roman*.

The *Red* or *Scarlet Nectarine* is by many much esteemed, because it leaves the Stone.

Besides all which, there are the *Great Green*, the *Little Green*, the *Cluster*, the *Yellow*, the *White*, the *Paper White*, the *Painted*, the *Russet*, the *Genoa*, the *Aegol*, the *Persian*, and the *Orbine Nectarines* that are very good Fruit.

## Chap. XV. Of Quinces.

THE *Portugal Apple Quince* is esteemed the best; it is a large yellow Fruit, tender, pleasant and soon boiled.

The *Portugal Pear Quince* is much like the former, except in its form.

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The *Barbary Quince* is lesser than the other, as is the *English Quince*, which is a harsh Fruit and covered with a Down or Cotton.

The *Lyons Quince* is a large Yellow, and the *Brunswick Quince* a large White, both very good ; but all inferiour to the two first sorts.

### Chap. XVI. Of Figs.

**F**IGS are highly esteemed by some, whereof the *Great Blue Fig* is most accounted of ; next unto it the *Dwarf Blue Fig*, being much less in Tree and Fruit, but better tasted and sooner ripe.

### Chap. XVII. Of the Cornel Tree.

**T**HE *Cornel Tree* beareth the Fruit commonly called the *Cornelian Cherry*, as well from the Name of the Tree as the *Cornelian Stone*, the Colour whereof it somewhat represents. This Fruit is good in the Kitchen and Conservatory.

### Chap. XVIII. Of the Pruning of Fruit-Trees.

**I**T conduceth very much to the proof and growth of a Tree to be well *pruned* from its unnecessary and injurious Branches.

If a Tree is to be transplanted, and you are obliged to lessen the Roots by taking of it up, you must take care to lessen the Head, that there may be a proportion between the one and the other ; because the Head depends upon the Roots for its nourishment.

In *February* and *March* is the best time to Prune Trees, only you must observe to Prune the most luxuriant

luxuriant and vigorous last, and to cut your Boughs close to the Body, where you cut them quite off; only *Peaches* and *Nectarines* are not to be cut till they begin to Bud.

Wall-Trees are to be pruned in Summer, and in Winter, the Summer pruning is to be about *June* or *July*, to take off the superfluous Sprigs or Shoots of the same Years growth from *Vines*, *Apricots*, and other Trees that put forth large Shoots that impede the Fruit from its due maturity, and contract much of the Sap of the Tree to themselves and thereby rob the other.

In Winter as soon as the Leaves are off the Trees, you may prune and cut away the residue of the Branches, and place those that are fit to be left in order: this Work may be continued throughout the Winter, except in great Frosts, and observe to cut away superfluous Branches, or such as cross one another, or grow too thick, or that offend any other Tree, or place, or that are broken, bruised or decayed, and all the *August* Shoots wherever you find them, unless the place be naked and that you suspect the next old Branch will not suffice to cover it, and Branches that shade the Fruit too much.

In pruning of Trees, especially Wall-Trees, be sure to leave the small Twigs that are short and knotted and that blossomed the succeeding Year, for you may observe that most *Apricots*, *Peaches*, *Plums*, *Cherries*, &c. grow on these Sprigs, being usually of two Years growth; they are therefore to be carefully nourished, and not cut off, as is usually done to beautifie the Tree.

Every Bud which hath but a single Leaf produces only Wood: but that of Fruit hath many Leaves, and the more it hath, the sooner it will bear, and the greater will be its Fruit.

The Fruit-Buds which grow on the Body of the Tree, produce fairer Fruit than such as break out of the collateral Twigs and tops of Branches.

Rub off all the Buds which sprout out either before or behind your Wall-Trees: And,

If you design to have your Tree soon furnished on both sides, hinder it from shooting in the middle; and note, that the more you prune a Tree, the more it will shoot.

Make as few Wounds in a Tree as you can, and rather extenuate a deformed Branch, than haggle it in several places.

In Wall-Fruit cut off all gross Shoots, how fair soever they seem to the Eye, that will not without much bending comply well with the Wall: for if any Branch happen to be wreathed or bruised in the bending or turning (which you may not easily perceive) tho' it doth grow and prosper for the present, yet it will decay in time, and the Sap or Gum will be spewing out of it, which is the cause of the decay of many a good Tree.

In pruning of Trees or Vines leave some new Branches every Year, and take away (if too many) some of the old, which much helpeth the Tree, and increaseth its Fruit.

When you cut your Vine, leave two knots at the next interval, for usually the two Buds yield a Bunch of Grapes, the not taking care of which often makes Vines unfruitful.

If you cut off any Boughs or Branches, cut them sloping, so as the Rain and wet may fall off from them, and near to a Bud, that they may the sooner heal without leaving of any Stubs.

It is good also where your Tree is too full of Fruit to disburthen it of some of them, and the rest of the fruit will be the fairer.



The great thing to be taken care of in pruning and nailing of Trees, is to spread it like a Fan, that it may handsomely cover the Wall. See p. 394.

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Chap. XIX. *Of some other necessary Observations about Fruit-Trees.*

**S**trong or hot Dung is not good for Fruit-Trees till it is thoroughly rotten and cold, but on rich warm Land, Mud or Soil that lies in Streets or High-ways where it may be had, is best, especially for Apple-Trees.

Many applying of Soil and Manure to their Trees, commonly lay it near to the Stems, whereas they should lay it at a proportionable distance to the spreading of the Roots, according to the Age and long standing of the Tree.

If you have an Orchard or other Plantation that is old, and you have a mind to extirpate it upon the account of the decay of the Trees, either set out fresh Ground, or dress and dig the holes a Year before you design to plant them, letting of them lie open to take the Air, that the Sun and Frost may refresh the Earth, and do not plant your Trees in the places where your old ones stood, lest the old putrid Roots corrupt and spoil the young ones.

Winter-Fruit where there is Sun enough to ripen them, are more durable and lasting that grow upon stiff Land and commonly the best flavoured: but Trees that grow upon rich Land are the most thriving and bear the largest Fruit, tho' not of so good a relish.

However for them that live in the Northern Parts of *England*, I would advise them to plant chiefly Summer-Fruit, because the other seldom ripens

ripens kindly : only this may be considered, that where Plantations are upon a gravelly, sandy, rocky or Lime-stone Soil, there is at least two degrees difference between such a Soil in the North, and a cold Clay in the South. Besides, the declivity of a Hill of a Southern Aspect, being well sheltered, gives a great advantage to the ripening of Fruit. All which things are necessary for a Planter to consider, that he may accordingly suit his Plantation and Situation to one another.

Where Fruit-Trees are old it is good to Prune or Lop them well, and to Manure them often with Dung, rich Earth, or which is best with Lime or Chalk, where it is to be had. Sir *Hugh Platt* advises the taking of two Quarts of Ox or Horses Blood, and temper it with Pidgeons-dung, till it make it into a soft Paste, which he says is a most excellent thing to apply to the Roots of old Trees, the Roots being first opened and laid bare a few Days ; this will recover a Tree or a Vine almost dead, and must be laid to the Tree about the midst of *February*, and to a vine about the beginning of *March*.

I shall conclude this part of Husbandry relating to Fruit-Trees, with Recommendations of the Vine, the Juice of which being so much desired, and considering the advantages that it brings to those Climates and Countries that it is natural to ; I could not omit it without making some Essay towards the Propagation of so useful and beneficial a Commodity, especially since it is plain that Vineyards have formerly been in *England*, and that they are now in many Places of the same Climate with us, where they thrive to the great advantage of the Owner ; and therefore I cannot but think the want of *English* Wine to proceed only from negligence, and our easie procuring of it by means of our Navigation, which tho' it may seem  
to

to be an increasing of our Trade, yet it was procured upon a very uneven Balance while we had it from *France*. However, let any Commodity be procured upon the best Terms of Trade that can be proposed, it is much short of the advantage that any thing of a Nations own Product will amount unto: and therefore I could wish that a greater diligence were used for the promotion of it, especially in the South parts of *England*, which I should think the Essay of the Vineyards of that Worthy Gentleman Sir *William Basset's* near the *Bath* should incourage; since I have drank Wine made of his Grapes (as I have been informed) that I think was as good as any of the Wines that I have drank either in *Paris* or *Champaign*. What Art was used to it I could not learn, but it is what I think is worth inquiring after; and tho', I suppose, I may not propose the same method, yet when I come to treat of *English* Liquors I hope I shall be able to do somewhat towards the Improvement of it; and therefore I shall at present confine my self only to what relates to the Propagation and Culture of the *Vine*.

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## Chap. XX. Of *Vines*.

THE *Vines* most proper for our *English* Climate, I think are, *First*, The small *Black-Grape*, by some called the *Currant*, or *Cluster-Grape*, which I reckon the forwardest of the Black sort. *Secondly*, The *White-Muscadine*, the *Parsley-Grape*, and the *Muscadella*, which is a *White-Grape*, not so big as the *Muscadine*, tho' as soon ripe; and the *White* and *Red-Frontiniaque*, if planted in a very warm place.

The best Soil for *Vines* is the hottest Gravel, Sand or rocky Ground, provided they be kept well

well watered and shaded at first planting; and if the aforementioned Soils run much to Brambles, it is a promising sign of the *Vines* thriving; but whatever the Soil be, it ought to be fresh, and not to have been plowed up of a long time. The Soil will much forward their ripening, as I observed before.

The next advantage to be given to *Vines* in these cold Climates, is that of a warm situation and good shelter, which the declivity of an Hill lying to the South will best afford, especially if well sheltered from the North, and encompassed with a good Brick-wall, because Hills are not so subject to the Morning Fogs, nor infectious Mists, as low Grounds are: besides, flat Land does not so soon enjoy the benefit of the rising Sun; nor doth it stay so long upon them in the Evening; for since the *Vine* doth above all things affect a dry Soil, especially after the Fruit begins to be formed and approach to its maturity, there is nothing more noxious to it than at that Season to be infected with the cold heavy Damps of these Fogs. It is in that as much as in any other thing, wherein our more Southern Climates have the advantage of us.

*Vines* may be increased by Layers, which may be laid any time in Winter before *January*, and will often grow of Cuttings only stuck in the Ground in a moist place, and well watered in Summer, if it prove a dry time, or of Suckers.

For to plant a Vineyard, in *July*, when the Earth is very dry and combustible, plow up the Swarth and burn or Denshire it, as is before directed about plowed Land. In *January* following spread the Ashes.

The Ground being thus prepared, make your Trenches cross the Hill from East to West, because the *Vines* standing thus in Ranks, the rising  
and



and setting of the Sun will by this means pass thro' the Intervals, which it would not do if they were planted in any other Position; nor yet would the Sun be able so well to dart its Beams upon the Plants during the whole course of the day.

To plant the setts, strain a Line and dig a Trench about a Foot deep, and set your Plants in it about three Foot distance every way one from another, trim off the superfluous Roots of your Setts, and leave not above three or four Eyes or Buds upon that which is above the Ground, and plant them about half a Foot deep, setting of them sloping as they commonly set Quick, so as that they may point up the Hill: which being done, take long Dung or Straw and lay on the Trenches of a reasonable thickness to cover the Earth, and to preserve the Roots from the dry piercing Winds which would otherways much prejudice them, and from the burning heat in Summer! Keep them well howed and clean from Weeds, and if need be water them. The best time to plant them is in *January*.

The first pruning of the new set *Vine*, ought not to be till *January* after its planting, and then you should cut off all the Shoots as near as you can, sparing only one of the most thriving ones, on which you should leave only two or three Buds, and so let it rest till *May* the second Year after planting; and then be sure to clear the Roots of all Suckers which do but exhaust and rob your Setts, for the small Branches of *Vines* produce no Fruit, and leave no Branches but what break out of the Buds you left before, continually taking care to suppress the Weeds. The same method is to be taken the third Year, by cutting off all the Shoots in *January*, sparing only one or two of the most thriving; which being done, dig all your Vineyard, and lay it very level, taking great care that

that in this Work you do not cut or wound any of the main Roots with your Spade: as for the younger Roots it is not so material, for they will grow but the thicker, and this Year you may enjoy some of the Fruit of your Labour, which if answerable to your Expectation, will put you upon providing of Props for them of about four Foot long, which must be placed on the North-side of your Plant. In *May* rub off such Buds as you think will produce superfluous Branches. When the Grapes are about the bigness of birding Shot, break off the Branches with your Hand at the second Joynt above the Fruit, and tie the rest to the Prop. The best way is to break, and not cut your *Vine*, because wounds made with any sharp Instrument are not apt to heal, but cause the *Vines* to bleed.

*Fourth Year.*

The following Year after its bearing you will be likely to have three or four Shoots to every Plant, and therefore in *December* cut off all the Branches except one of the strongest and most thriving, which leave for a Standard about four Foot high, cutting off the rest very close to the Body of the Mother-Plant, which tie to your Prop till it is big enough to make a Standard of it self: and then you must suffer no Shoot to break out but such as sprout at the top about four Foot from the Ground, all which Sprouts the *French Prune* off every Year, and trust only to the new Sprouts which are the only bearing Shoots. But others propose to leave two or three Branches the one successively after the other, and so they always cut off the oldest every Year, and Nurse up the other young ones; but the number of the Branches should be proportionable to the Thriftiness of the *Vine*.

In *August* when the Fruit begins to ripen, break off such Shoots as you find too thick; but this Work you must do with discretion, and only so as

to

to let in the Sun for the ripening of the over-shadowed Clusters, but not to leave them too bare, lest you expose them too much to the scorching Heat by Day, and the moist Dews by Night. If you find a *Vine* to bleed, rub some Ashes upon it; and if that will not do, some commend the searing of it with an hot Iron.

When thro' often stirring of it you find your Vineyard poor (which the weakness of the Crop will soon discover) prune your *Vine* as is before directed, and spread good rotten Dung mixed with Lime over the whole Ground, letting of it lie a whole Winter to wash into the Ground, mixing of about ten Bushels of Lime with a load of Dung, and if some Ashes or Soot be likewise spread on it, it will do well, which Manure turn in about *February* with a slight digging, but not too deep, which should be performed in a dry Season, and not in wet, lest it occasion the Ground to bind too much, and cause the Weeds to grow. But to forward Grapes ripening and to make them fruitful, the Blood of Beasts mixed with Lime or Soot is very good to lay to the Roots of *Vines* in *December* and in *July*; and if the Season is very dry, the watering of *Vines* in *August* is a great advantage.

Gather your Grapes in a dry day when they are very plump and transparent, which is when the Seeds or Stones are black and clear, not viscous or clammy, when the Stalks begin to shrivel at the part next the Branch, which is a sign it hath done feeding; only you must take care if Rain come and Frost immediately follow, to gather them as soon as you can.

It is best to cut and not to pull the Grapes from the *Vine*, and to put them in Baskets, out of which, empty them gently, and lay them on heaps on a Floor to sweat for four or five Days or a Weeks time, which will ripen them much.

If



If you would make *Claret*, let it remain with the Murc or Husks till the Tincture be to your liking, but the *White-Wine* may be pressed out immediately.

When the *White-Wine* is tunned, some propose to stop it up immediately, and say that it will not hurt the Cask, and leave half a Foot or more void; and for *Claret* leave something more, which they replenish at ten days end (when the fury of working is over) with some proper Wine that will not provoke it to work again. This must be frequently repeated, for new Wine will spend and waste somewhat till it is perfect.

This is the manner of *Languedoc*, and the Southern parts of *France*, and about *Paris*, they let it abide with the Murc in the Must two Days and Nights for *White-Wines*, and at least a Week for *Claret*; but then they observe to let it be well covered.

In some parts of *France*, they Tun it when it hath wrought in the Kellers, filling of it up (as before is described) with what is squeezed from the Husk, which some think very practicable with us.

Whilst the working and filling of it up continues, keep it as warm as you can, by closing up any Northern Windows, if you have any in your Cellar, lest it sour the Liquor, and about the expiration of *March*, stop your Vessel for good and all. Some about this time roll their Cask about the Cellar to mix it with the Lees, and after a few days re-settlement, they rack it off with great Improvement.

*Wine to Fine.*

Put into your Vessel the planing or Chips of green *Beech*, the Rind being carefully peeled off; but first boil them in clean water about an Hours space to extract their rankness, and then dry them in the Sun or an Oven: Less than a Bushel of Chips purifies



will be sufficient to fine a whole Tun of Wine, and it will set your Wine in a gentle working, and purifie it in twenty four Hours, giving of it a good and agreeable Flavour.

These Chips may be washed again, and will serve the better upon the like occasion, even till they are almost consumed. Let your Chips be planed off as long and large as you can get them, and put them in at the Bung.

Some sweeten their Wines (to prevent harshness) with Raisins of the Sun trodden into the Fat being a little plumped before, or by boiling one half of the Must or Liquor in a Vessel for an Hour, scumming of it, and tunning of it up hot with the other.

But the best method that I have met with to *English Wine* make *English* Wine, is after the Grapes are picked from the Stalks to press them, and to let the Juice stand twenty four Hours in the Fat, draw it off from the gross Lees, and put it up into a Cask, and to every Gallon of Juice add a Pint or Quart of strong Red or White Port, according as you desire it in strength. Let it work together, and when it hath done, Bung it up close, and let it stand till *January*, at which time in dry Weather Bottle it; this way I have made as good Wine, as any *French* Wine without any adulteration, which consisting of four parts of our own Product, and but one of Foreign, must be of advantage for the promotion of our own Grapes.

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### Chap. XXI. *Of gathering of Fruit.*

**Y**OUR Trees having attained to their desired end of bearing Fruit, it will be necessary to consider the methods to be used in gathering, transporting and keeping of it.

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As

Gathering of  
Fruit.

As to the gathering of Fruit, care must be taken to do it without bruising, especially of such as you design to keep, and that you do it when they are arrived at their due Maturity, at which time they are not only best for eating, but keeping too. Fruit ripens sooner or later according as the sort is, and the Season of the Year falls out, or that they are situated and sheltered, and that the Soil is either hot or cold. But the best time for the gathering of Winter-Fruit, is about *Michaelmas* after the first Autumn-Rains come, when the Tree being sobbed and wet swells the Wood and loosens the Fruit: or when the Frosts advertise you that 'tis time to lay them up, beginning to gather the softest Fruit first, but mind never to gather Fruit in wet Weather.

Transporting  
of Fruit.

For the Transportation of Fruit, or the carrying of it to Market, &c. *Apricots, Peaches, Figs, Strawberries, Cherries, Rasberries, &c.* require Water-carriage, or to be carried on Men's Backs; but for *Peaches* or *Apricots*, they should be laid upon that part that the Stalks grow out of, without touching of one another, and to be laid upon a Bed of Moss, Fern or Leaves, or to be wrapped up in Vine Leaves. And in Case several Beds be laid one upon another, a good quantity of Moss ought to be laid between them.

*Figs* are very tender, and therefore each *Fig* should be wrapped in a Leaf, and small Partitions made with Splinters, like the bottom of Sieves, to part each Layer in the Basket, that so they may not lie one upon another.

*Plumbs* may be put in a Basket without any other ceremony, than the laying of Leaves at the bottom and top.

*Strawberries* and *Rasberries* are commonly put into small Baskets made on purpose for them, and the

the Leaves laid at top and bottom, and stuffed by the sides.

*Apples* and *Pears* are commonly packed in Baskets, with a good quantity of Straw at the bottom and top.

As to the preserving of Fruit, if it is Summer-Fruit (especially *Peaches*) they must be laid in a dry place on Shelves with the Windows always open, and upon dry Moss or other soft things that have no ill scent or savour; for *Peaches* like *Melons* eat better for being gathered a day or two before they are eaten. All Fruits must be visited daily, and the rotten ones picked out, lest they should infect the other. *Pears* may be placed with their Eye downward, but beware of laying of them or *Apples* upon Hay, Wheat or Rye Straw, which will give the first an ill flavour, and leave the other none; the best Straw is that of Oats, but Fern or Blankets is much better.

The best way to keep *Grapes* is to hang them up in the Air fastned to a Packthread: but if any are desirous to preserve them till towards Spring, they must be gathered before they are perfectly ripe, and care must be taken constantly to pick out those that are rotten. Some say, the best way to keep them, is to hang them up in a Barrel, which must be headed up so close that no Air may come at them. Some lay them in a Cask in Oat-chaff.

But as *Apples* and *Pears* are of long duration, it will be necessary for those that are curious in keeping of them, to have a Conservatory or Storehouse made after this manner: choose some place in your House the most convenient for this purpose, which should have the Windows and Overtures narrow, to prevent the extremity both of heat and cold. These should always be kept shut except in very fine Weather.



About the Room should be Shelves made one above another, and the middle be left to lay Fruit in on heaps, such as are the most common, or that you design for Cyder; but if your Room be narrow, then only Shelves on one side, and the two ends will be enough.

Let your Shelves be laid upon Brackets, being about two Foot wide, and edged with a small Lath to keep the Fruit from rowling off of them, placing of them about a Foot asunder.

And as you gather your Fruit, separate the fairest and biggest from the middling, and such as are fallen off of themselves, or that were thrown down in gathering: and putting each sort into Baskets, as fast as you gather them, carry them into your Store-house, and range them upon your Shelves, so as that they may not touch one another, laying of Fern under them, and having of a good quantity more of Fern by you, cover them well up with it, and in case of Frost you may lay Blankets and other things to secure them; but in very severe Frost, some commend a wet Sheet to lay over them, as the best thing to preserve them. Be sure your Fern is very dry, and let it be cut in Summer while the Sap is in it, and that it have contracted no ill flavour or mustiness.

And every other day look carefully to the *Apples* and *Pears*, and take out all that are speckt or rotten, lest they infect the others.

As for the time of Fruits being in Season and their lasting, I shall have occasion to mention a great number of them in the Kalendar.



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BOOK XV.

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## Chap. I. Of English Liquors.

**H**AVING given an account of the way of ordering, managing and improving of Corn and Fruits; I shall in the next place endeavour the Improvement of *English Liquors*, which is a part of Husbandry that I think is too much neglected; and therefore I shall give the best help towards it that I can, and begin with *Beer*, as the most common Liquor, and what for the want of good management, is generally the most spoiled, of any Liquor we make,

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## Chap. II. Of Beer and Ale.

**I**N the brewing of Beer, two things must particularly be taken Care of; *First*, Good Malt, which I have already given an account how to make. And *Secondly*, Good Water, that is soft, and will bear soap, for harsh Water makes not only unpleasant *Beer* or *Ale*, but likewise requires much more Malt than soft, and that in proportion to the harshness or softness of it; and *Lastly*, Being provided with good Hops,

*First*, Heat a Hogshead of Water and cover it with Bran; when it is scalding hot, put one third part of it into the Mashing-tub, and there let it stand till the Steam is so far gone that you may see your Face in the Liquor, then stir in four Bushels of Malt, and let the remainder of the Water in the Copper boil a little, and then draw out the

Fire, that the heat of the Water may be qualified before you put it to the Malt, and when it is of a due heat, add it to the other part that you put in the Mashing-tub before, and stir it well again, putting up two or three Shovels full of hot Wood-coals upon it, to take off any ill Taint of the Malt : then let it stand two Hours, in that time heat a Hoghead more of Water ; and when your first Wort is drawn off, put part of it upon the Grains, and stir in the three Bushels of fresh Malt, then add the rest of the Water and stir as before, after which put your first Wort into the Copper again, make it scalding hot, and put part of it into a second Mashing-tub, and when the Steam is gone, stir in three Bushels of fresh Malt, then put up the rest of the Wort, and stir well as before, letting of it stand two Hours, and put another Hoghead of Water into your Copper, and when what was put in the first Mashing-tub hath stood there two Hours, draw it off, as also that Liquor in the second Mashing-tub, and take the Grains out of the second Mashing-tub, and put them into the first, and put the Water that was scalded in the Copper to it, which let stand in the Mashing-tub an Hour and an half at most ; and while that is standing get ready another Copper of Water (the Copper containing about a Hoghead) which put upon the Grains, and let stand as before ; only Note, that in all the Mashings (when you think that the Liquor hath stood long enough upon the Malt) before you let it run out, you draw out some of the Liquor first, and see if it run clear ; if it doth, draw off ; if not, fling it up again, and let stand it till it doth. Then take the first Wort and boil it with two Pound of Hops, two Hours, or till you find it look curdly ; after which boil the second Wort for *Alc* an Hour and an half with three quarters of a Pound

Pound of Hops, and the Hops that were boiled in the first an second Wort, boil in the remaining Liquor an Hour and half, which quantity will make a Barrel of *Strong-Beer*, and a Barrel and a half of *Ale*, and one Hogshead and a half of *Small-Beer*. This is the best way of brewing your *March* and *October Beer*.

But for the brewing of *Small-Beer*, or common *Ale*, take something above the quantity of a Barrel of Water scalding hot, which put into your Mashing-tub alone; let it cool till you can see your Face in it, and put to it four Bushels of Malt, pouring of it in by degrees, and stirring of it well: let it stand on the Malt two Hours (observing the same method as before proposed for *Strong-Beer*) then draw it off, and let it boil an Hour and an half in Summer, or an Hour in Winter; and when it is boiled enough, it will look curdled. Of this first Wort you may make a Barrel of *Ale*: after this is boiled, scald about a Barrel of Water more, and put it upon your Malt, letting it stand an Hour and an half: this draw off, and put the same quantity of hot Water on again, observing the same Rules as before directed, of this you may make an Hogshead of *Small-Beer*. When you put it together to Work, take care that it is not too hot, and when you put Yeast to it, put it to a small quantity at first, and add more and more to it by degrees, and when it hath worked twenty four Hours in the Tub, Tun it up. But if you Brew *Small Beer* alone, two Bushels of Malt and a Pound and a half of Hops will make a Hogshead of good *Small-Beer*.

These Proportions of Brewing are for a small Family, which I chuse to instance in; because others may easily proportion it to larger quantities as they please.



To what hath been already mentioned, I shall add the manner of brewing of *Ale* and *Beer*, publish'd by Sir *Jonas Meor* in a small Treatise of his; which as it contains a great many particulars, and is recommended from his own Experience, may be of use to the publick, which take in his own Words.

In the Brewing of *Ale* and *Beer*, after you have made a discreet choice of your Materials, you must first consider what sort of Drink you design to Brew, and accordingly proportion your quantities. If you design your first Wort for *Strong-Ale*, or *March* or *October-Beer*, you must proportion five Gallons of Drink to every Bushel of Malt (that is to say avoiding Fractions) eleven Bushels of Malt to an Hogshead of *Ale* or *Beer*. But it must be remembred, that in so great a disproportion of Malt Drink as eight to five, almost a third of your Liquor in the first Wort will be absorbed by the Malt never to be return'd, and an allowance is to be made of about a sixth part to be evaporated in boiling; so that if you expect to clear a Hogshead of Drink, that is fifty four Gallons, from your first Wort, you must put into your Mash-tub near ninety Gallons of Liquor. But for your second or third Worts, the Malt being wet before, you need put up no more Liquor than you intend to make Drink, except an allowance of about a tenth part for wast, that not boiling so long as your first Wort: and you may of your second Wort make one Hogshead of good middle *Beer* or *Ale* as strong as the common Ale-house Drink in *London*; and your third Wort will make one Hogshead of good *Small-Beer*.

I propose, in this Case the drawing off three Worts, because of the great quantity of Malt to a smaller of Liquor; otherwise in ordinary Brewings, where you design not very strong Drink, six or seven Bushels of Malt will make one Hogshead  
of



of good Strong and another of *Small-Beer*. And in such Cases two Moakses will as well take out the strength of your Malt, as three in the other.

The proportion of Hops may be half a Pound to an Hoghead of Strong-Ale, one Pound to an Hoghead of ordinary Strong-Beer to be soon drunk out, and two Pounds to an Hoghead of *March* or *October* Beer. And for the after Worts which are not to be kept long, what comes from the first Wort will serve well enough to boil again with them.

If you put into your first Wort a greater proportion of Hops, and boil them all the while your Wort boils, you will make it too bitter. But I conceive it advisable to double the proportion by taking out the first Parcel, when your Wort has boiled half the time you design it; and then adding the same quantity of fresh Hops, to continue boiling till you take your Wort out of the Copper. This will somewhat encrease your Charge, but that will be very inconsiderable, if you furnish your self in a cheap Year of Hops.

Hitherto of the Qualities and Proportions of your Materials; now concerning the manner of putting them together.

After you have put your Liquor into your Copper, strew an handful, or two or three handfulls of Bran or Meal upon it, not so much to strengthen your Liquor, as to make it heat quickly, for simple Water alone will be long e're it boil. But you must take your Liquor out of the Copper when it begins to simmer, and not suffer it to boil; for tho' it were granted that the boiling did no harm to your Liquor, by evaporating the natural Spirit of the Water; yet it is a needless expence of Fuel and time, first to make it too hot, and after to stay till it is cooler again. For you must by no means mix your Malt with boiling hot Liquor, which  
will

will make the Malt clot and cake together, and the most flowery parts of it run whitish, glewy and fizy, like Sadlers Past, so that it will never mix kindly, nor give out its strength equally to the Liquor.

I had not dwelt so long on this head, but that I know many put their Malt first in the Mash-fat, and then pour in their Liquor for the first Wort, which is indeed necessary in the second and third Worts.

The contrary Practice of putting in your Liquor first hath these advantages.

*First*, You can never otherwise guess when your Liquor is just cool enough to be mingled with your Malt. But in this case you have a certain Criterion and Rule to judge, that is, you must let your Liquor remain in your Mash-fat, till the Vapours from it be so far spent, that you can see your Face in the Liquor: and then pouring your Malt upon it, you have this further advantage, that you keep your Liquor longer hot, and it sinks gradually, distributing its strength to your Liquor equally without matting, and if it does not descend fast enough of it self, you must press it down with your Hands or Rudder, with which you use to stir your Malt or Moaks. This must be done by degrees, always remembering that you shake your Sacks before you remove them over the side of your Mash-fat, to get out the Flour of your Malt which sticks to them; and after all your Malt is settled, and your Liquor appears above it, you must put up in your Mash-fat as much more hot Water out of your Copper, as will make in all ninety Gallons for one Hogshead: then stir it almost without ceasing, till it has been in the Mash-fat about two Hours from the first putting up your Malt, in which your Servants may help and relieve one another.

After

After this pull out your Rudder, and putting a little dry Malt a top, cover it close, and let it stand half an Hour undisturbed, that it may run off clear, and the Malt being sunk to the bottom, the Liquor at top will run thro' it again, and bring away the strength of it. After this, you must lift up your Tap-staff, and let out about a Gallon, not into your Tub underneath or Underback, which is to receive your Wort, but into your long Hand-jet, and put it back again, stopping your Tap-hole: this do two or three times, till you find it runs clear, which it will not do at first, tho' your Tap-hose be never so well adjusted.

Throughout the whole course of your Brewing, you must be very careful to do all you can to promote the fineness and clearness of your Drink.

In the North of *England* where much the best Malt-drink is made, they are so careful of making their Drink fine, that they let their first Wort stand in their Receivers till it is very clear, all the gross Parts being sunk to the bottom; this they continue to do about three Hours in Summer, and ten or twelve Hours in the Winter, as occasion requires, which they call *Blinking*: after which, leaving the Sediment behind, they only lade out the clear Wort into the Copper. This Custom is peculiar to the North, and wholly unpractis'd in other parts.

When all is run out into your Receiver or Underback, Lade or Pump out your second Liquor, ordered so as to be then just ready to boil, on your Moaks, and putting your first Wort in your Copper again, let it boil reasonably fast (which boiling, the Hops put on it will much accelerate) for about one Hour, and an half for *March* or *October-Beer* to keep long, and one Hour for *Strong-Ale* to be drank new. I know that a longer boiling is generally advised; but that I shall answer when I come to



to shew the Reasons, why common Brewers seldom or never make good Malt-drink. I advise the Wort rather to be boiled reasonably fast for the time, than to stand so long to Simmer, because common experience shews it wastes less, and ferments better after so long boiling than simmering.

Your first Wort being thus boiled, must be pumped or laded off into one or more Coolers or Cool-backs, in which leave the Sullage behind, and let it run off fine. The more Coolers and the thinner it stands, the sooner it cools (especially in hot weather) the better; let it run from your Cool-back into your Tun very cool, and set it not there to Work in Summer till it is cool as Water. In Winter it must be near Blood warm at least; the Bowl in which you put your Yeast to set the rest on Working, must have a mixture of Wort hot enough to make it all ferment: when you find it begins to Work up thick to a Yeast, mix it again with your Hand-jet: and when it has wrought it self a second time to a Yeast, if you designed it for *Ale*, and speedy drinking, and hopped it accordingly, beat in the Yeast every five Hours for two Days together in the Summer time, or more, according as the weather is, and for three or four Days in the Winter, covering your Fat close, that it fall not in your Working-Tun.

When your Yeast begins to Work sad, and upon the turning of the Concave of your Bowl downwards sticks fast to the inside, then skimming off the Yeast, first cleanse the rest into your Vessel, leaving all your Dregs in the bottom of your Tun, and putting only the clear up. After it has a little fermented in your Vessel, you will find it in a few Days fine and fit for your drinking, tho' according to the quantity of your Hops, you may proportion it for longer keeping.

If you Brew in *March* or *October*, and have hopped



hopped it for long keeping, you must then upon its second Working to a Yeast (after once beating in) cleanse it into your Vessel with the Yeast in it, filling it still as it Works over, and leaving when you stop it up a good thick head of Yeast to keep it.

In brewing *March* and *October-Beer*, it is advisable to have large Vessels; bound with Iron Hoops containing two, three or four Hogsheads, according to the Quantity you intend to make, putting all into one Vessel; this sort of Drink, keeping, digesting and mellowing best in the largest quantities.

Your Vessels must be Iron-hoop'd, else your *March-Beer* will be in danger to be lost or spoiled; leaving your Vent-peg always open palls it; if it happens to be fastened but six Hours together in the Summer, a sudden Thunder or Stormy Night may happen next Morning to present you in your Cellar an empty Vessel and a covered Floor.

It is pretended, that *March* is the best Month for brewing, and the Water then better than in *October*; but I always found that the *October-Beer*, having so many cold Months to digest in, proves the better Drink by much, and requires not such watching and tending as the *March-Beer* doth in opening and stopping the Hole on every change of the Weather.

Many Country Gentlemen talk of and magnifie their stale Beer of Five, Ten or more Years old; it is true, more Malt and Hops than I propose will keep Drink longer than I use to do; but to small purpose, for that it will not exceed mine in any thing desirable, except such an extraordinary strength as few Men care for: I always broach mine at about nine Months end, and my *March-Beer* at *Christmas* and my *October-Beer* at *Midsummer*, at which time it is generally the best; but will keep very well in Bottles a Year or two more.

Stop

Stop your Vessel close with Cork not Clay, and have near the Bung-hole a little Vent-hole stopp'd with a Spile, which never allow to be pulled out till you bottle or draw off a great quantity together; by which means it is kept so close stopp'd, that it flushes violently out of the Cock for about a Quart, and then stops on a sudden and porles and smiles in a Glass like any bottled Beer, tho' in the Winter time. But if once you pull out the Vent-peg to draw a Quantity at once, it will sensibly lose this briskness, and be some time before it recovers it.

I propose no Directions for the second and third Worts, he that can manage the first well, can never fail in the rest. Your third Wort being pour'd on hot Goods may be only cold Water.

But which is the best Method to be used I must refer to Experience.

### Chap. III. *Of Nottingham-Ale.*

**T**HE chief thing that they observe in making of it, is, only when it is working, to let it stand in a Tub four or five days before they put it into the Cask, stirring of it twice a day, and beating down the Head or Yeast into it; this gives it the sweet Aleish Taste.

If Ale or Beer do not fine well, put into a Hoghead two or three Bottles of old stale Beer or Ale, and it will much help it.

Chap.

## Chap. IV. Of Cyder.

**N**EXT unto *Beer*, *Cyder* is of the most common use, of which excellent Liquor there are several ways of making it according to the Skill of the Operator, and the Palates of those that are to drink it, some esteeming one sort of *Cyder* best, and some another, according to the Fruits it is made of, and the Methods used by them that make it.

Now *Cyder-Fruit* may be reduced to two sorts or kinds, either the wild, harsh and common *Apple* growing in great plenty in *Hertford*, *Worcester* and *Gloucestershires*, and in several other adjacent places in the Fields and Hedge-rows, and planted in several other places of *England* for *Cyder* only, which are not at all tempting to the Palate of a thievish Neighbour, nor requiring the charge and trouble of the more reserv'd Inclosures.

Or the more curious *Table-Fruit*, as the *Golden Pippin*, the *Kentish Pippin*, and *Pearmain*, &c. which are by many preferred, having in them a more cordial and pleasant Juice than other Apples.

For the former, the best sorts for *Cyder* are found to be the *Red-streak*, the *White Must*, the *Green Must*, the *Gennet Moil*, *Eliot's Stocken Apple*, *Summer Fillet*, *Winter Fillet*, *Broomsbury Crab*, the *Olive Under-leaf Apple*, and the *Fox Whelp*; the *Cyder* of which comes not to be good till 'tis three or four Years old.

The greater part of them being meerly Savage and so harsh that hardly Swine will eat them, yet yielding a most plentiful, smart and vinous Liquor, comparable, if not exceeding the best *French Wine*; and for the advantage of planting of them they claim the preference before *Pippins* or any other of our *Garden-Fruit*.

The

The other sorts of Fruit for the making of Cyder are, as I said before, the *Golden Pippin*, *Kentish Pippin*, *Pearmain*, *Gillyflower*, *Kirton Pippin*, *Mother Pippin*, &c.

The best sorts of Cyder-Fruit are far more succulent, and the Liquor more easily divides from the Pulp of the Apple than in the best Table-Fruits.

Some observe, the more red any Apple is the better it is for Cyder, and the paler the worse, and that no sweet Apple that hath a tough Rind is bad for Cyder; but the more inclinable to yellow the fleshy part of an Apple is, the better coloured the Cyder will be.

Gathering  
of Apples.

Apples of a bitter tast will spoil your Cyder, but the Juice of them and of Crabs will make as good Spirits as the best Apples when fermented; for neither the sowre nor the bitter tast arises with the Spirit.

Let your Apples that you make Cyder of be thorough ripe, and be carefully gathered without Bruises in dry Weather; it very much conduces to the goodness and lasting of the Cyder, to let them lie a Week or two on Heaps; the harsher and more solid the Fruit is, the longer they may lie, and the more mellow and pulpy the less time, which makes them sweat forth their Aqueous Humidity, and digesteth and meliorates the remaining Juice, but they will yield more from the Tree, than so kept.

Such as are windfalls, bruised, or any ways injured, or unripe Fruit, divide from the sound and ripe.

For it is better to make two sorts of Cyder, the one good and the other bad, than for all to be bad; the sooner such Fruit is pressed the better; and from your Apples take away all Stalks, Leaves and rotten Apples: because Stalks and Leaves give



give an ill taste to the Cyder, and rotten Apples make it deadish.

Let such Apples as fall before they are ripe be kept till the time of the full maturity of the other Fruit, or else the Cyder will not be worth drinking.

About twenty or twenty two Bushels of good Cyder-Apples, just gathered from the Tree, will make an Hogshead of Cyder; after they have lain a while in Heaps to mellow, about twenty five or thirty Bushels will make an Hogshead.

They that have great Quantities usually grind their Apples with a Horse-mill, such as the Tan-ners grind Bark with, but the new invented Engine described in Mr. *Worlidge's Vinetum Britannicum*, is a very good Mill, and will grind a great quantity.

After your Apples are ground they should be made up in Straw or in an Hair Bag, and so committed to the Press; of which there are several sorts, but the Screw-Press is the best.

But as there are several ways of making of Cyder as well as several sorts of Fruit to make it of; and that some esteem one sort of Cyder and some another, according to the manner of its making; and the Fruit it is made of, as I said before, I shall endeavour to give you several of the methods I have met with, and leave them to your Experience. But

I think the chief way of improving of this Liquor would be a particular management of it according to the Species of Apples it is made of (especially what is made of the chief Cyder-Apples.)

*Chap. V. Several Ways and Methods of making Cyder.*

**A**S first that of Mr. *Worlidge*, who proposes, that when your Cyder is pressed out it should stand a day or two, or more, in an open Tun, or covered only with a Cloth or Boards to keep it from Dust, or in a Hoghead or other Vessel not quite full, with an open Bung, till the more gross parts subside, and then to draw it into Pails, and fill it up into the Vessels you intend to keep it longer in, leaving about an eighth part empty. Set these Vessels in your coldest Cellars or Repositories with the Bung open, or covered only with a loose Cover, that there may be a free perspiration of the Volatile Spirit of your Must, which would otherwise force its way, and that your Must may be cool and not kept warm, lest it ferment too much.

Thus standing open, the better it will by degrees let fall its grosser parts, and in time become clear without the loss of any of its true and durable Spirits. For Coldness is here the cause of its purifying, warmth occasioning the solution and detention of those Particles that spoil the Colour and Taste of Cyder, and which would otherwise precipitate.

As for the time of its standing open in the Vessel, it varies according to the nature of the Fruit; if the Fruit were mellow or sweet, the more of the gross Particles will be pressed out with the Liquor, and so the longer time will be required for their Precipitation: But if the Fruit were hard or sharp, the thinner doth the Liquor issue out of the Press, and the sooner will your Cyder become fine: and you must be sure to observe, that as soon as this Cyder of hard Apples is fine, you must draw it off from its precipitated Lees, lest it become acid, or acquire some ill taste from them.

This

This standing open of the Vessel causeth an expence of that Wild or Volatile Spirit, which being pent in, would beget a continual fermentation, much prejudicing the Cyder; and in case it doth not otherwise work its way out, would in time break the Vessel that detains it.

The principal cause that there hath been so much bad Cyder made in most parts of *England*, was the too early stopping of it up: It being usually prescribed, and as usually practised, that as soon as Cyder is prest, strained and fermented, they stop it close with a very great confidence; that unless it be close stopped it will decay and become of no use; so that when these Cyderists have taken care for the best Fruit, and ordered them after the best manner they could, yet hath their Cyder generally proved pale, sharp and ill-tasted, &c. and all from the too early stopping of it. For the stopping of Cyder close before it be fine, or with its Fæces in it (although precipitated) begets reiterated Fermentations, which Fermentations very much impoverish this Liquor by precipitating those Particles which enrich it with Tincture and Gust.

Whilst its gross Fæces, or any settling remain in the bottom, every change of Weather causes some motion therein, which is usually termed Fermentation; this doth so attenuate this Liquor, that it easily letteth or suffereth those Particles to subside, and leaveth the Cyder thin, jejune, acid and ill-tasted. It is thin and jejune, because it hath lost its Substance; acid because it hath lost its Sweetness; those Particles being the Saccharine Substance, or part of the Apple; and of ill Savour and Gust, because those Particles, when precipitated, being mix'd with the more gross do putrifie and heat, infecting the whole Mass in the Vessel: all which effects are apparently obvious

in Cyder made after the vulgar Method. These Fæces are the cause, that the Corks fly out of the Bottle, or break the Bottles, or at least at the opening of them make the Cyder fly, and mixing with it make the residue unpleasant.

These things being generally taken notice of, have set many Heads at work to provide Remedies: Some have made use of many ways to ferment it and make it clear by reiterated Fermentations; others by additions, as Iling-glass, &c. have enforced a Precipitation, and when they have so done, finding it to be thin, pale and acid, have by Molasses, Treacle, or course Sugar given it Body, Colour and Gust. What delight or pleasure there can be in drinking such Compounds, or how much this must conduce to Health and long Life, I leave every unprejudiced and ingenious Man to judge

After your Cyder hath stood open some reasonable time, till it is become indifferently fine, which it may be in three, four or five Weeks, then will it be convenient to draw it into Bottles, if you have a sufficient stock, or into other Casks, that it may there become more fine; for after it is separated from its gross Fæces it will more easily remit the remaining Particles or flying Lee, than it would have done whilst the grosser parts remained, renewing its Fermentation on every change of Air or other accidental occasion.

Its Fineness will sometimes plainly appear if you move the Scum aside with a Spoon, or the like; but to be more exact, you may take a Glass Pipe of a foot or more in length, open at both ends, stop the upper end of the Pipe with your Thumb, and let the other end down into the Cyder as deep as you think fit, then open the upper end, by removing your Thumb, and the Cyder will rise in the Pipe; then stop the upper end again with your Thumb, and take out the Pipe and  
hold



hold it over a Drinking-glass, remove your Thumb, and you may there discern the state and fineness of your Cyder.

If your stock of Cyder be not over-great, or that you are willing to preserve your choicest sorts of Cyder, the best way is to have large Glass-Bottles of one or two Gallons apiece, more or less, enough to receive the same, into which draw off or rack your Cyder, and let the Bottles stand open, or but barely covered, in your coolest Repository for a Month or more, till you observe your Cyder, by your interposing it between a Candle and your Eye, to be very transparent; which then may be called Superfine, the remaining Particles or flying Lee being precipitated and settled in the bottom of the Glass-Bottle.

If the Quantity of your choicest Cyder be too great for your Bottles, you may instead of them make use of Stone-Bottles, or Jarrs, or Stounds of *Flanders* Earth, or glazed Earthen Vessels, the larger the better; which may be placed in Rows in your Repositories, Cellars or Vaults, and covered with Boards or the like, to preserve your Cyder from Dust, &c. but not from the Air; but by reason that you cannot so easily discern the fineness of your Cyder in these as in the transparent Vessels, you may now make use of your Glass Pipe before-mentioned.

The reason why Glass-Bottles or other glazed or stone Vessels are more fit for this second fining than those of Wood, is, for that the coolness of the Vessel very much contributes to the Precipitation of those remaining Particles that would otherwise debase this Liquor.

But if your Quantity of Cyder be so great, that these Vessels cannot receive it, then may you rack it into other Vessels made very clean, dry and sweet, and suffered to stand slightly covered till

it be very fine before you stop it up: If you find that your Cyder doth not fine in wooden Vessels so soon as you desire, for want of that coolness that is in glazed Vessels, you may take Flints or Pebble Stones clean and dry, and put them into your Cask of Cyder, this is said (and with great probability) to contribute much towards the nimble precipitation of the Fæces; the like effect hath the applying of a Bag of Salt to the outside of the under part of the Vessel.

When your Cyder has attained its utmost degree of fineness, which after this way of ordering it will do if you have but patience to let it stand open long enough (altho' some will fine in half the time that other requires) then take your Glass Syphon or Crane and draw it off from its last Fæces into smaller Bottles, wherein you intend to keep it for your use. Thus being drawn off and thoroughly depurated you may close cork all your Bottles, and place them in your cool Conservatory, where after a few Weeks standing, your Cyder will acquire a fine briskness, and mantle in the Glass without any manner of Feculency, and retain its first Sweetness, and change from a Pale to a lively Canary or Malaga Colour; but if you have occasion to accelerate its Maturity, place so many of your Bottles as you think you may have sudden occasion for, in some place warmer than your usual Conservatory, and it will soon answer your expectation.

Sometimes it will happen, that the next Summer after it is become so pure, some Rags or flying Feculencies may appear in your Bottles, which are occasioned by the warmth of the Season begetting another fermentation from that fatness of the Body of the Cyder made of the sweeter sort of Fruit, which are not apt to appear in the thinner Cyder; but in some short time these will subside,  
and

and you may draw off the Fine from the Fæces with your Syphon, without any great prejudice to your Cyder. These later Fermentations in great Quantities of Cyder often spoil it for want of a timely prevention, which cannot be so well done in Vessels of Wood as those of Glass, where you may easily perceive the various changes that may happen in these Liquors. Thus far you have Mr. Worlidge's Opinion of this Liquor.

*Mr. Cook's way of making of Cyder is after this manner.*

Let your Fruit hang till through ripe, which is best known by the brownness of the Kernels, or their rattling in the Apple, or the Apples falling much in still Weather; for if the Fruit be green, your Cyder will be sowre. Gather your Apples dry, and reject such as are bruised, because they will rot and spoil the tast of the Cyder.

If you gather not by hand, which is tedious, lay a Truss of Straw beneath the Tree, and over that a Blanket, discreetly shaking them down, not too many at a time, but often, carrying them where they are to sweat, which should be on dry boarded Floors; by no means on Earth, unless store of sweet Straw lie under it. In about ten or fourteen days they will have done sweating, then grind or beat them, keeping the Fruit several, in case you have enough to fill a Vessel of one kind; if not, put such together as are near ripe, for its more uniformly fermenting: Winter-Fruit may lie three Weeks or a Month e're you grind them; the greener they are when gathered, let them lie the longer.

Being ground let them continue twenty four hours before pressing, it will give it the more Amber bright colour, hinder its over-fermenting, and

if the Fruit were very mellow, add to each twenty Bushels of Stampings six Gallons of pure Water poured on them so soon as beaten; the softer and mellow the more Water to restrain its overworking, and tho' the Cyder be weaker it will prove the pleasanter: for over-ripe and mellow Fruit let go so much of the loose and fleshy Substance thro' the Percolation, that with difficulty you will separate the Lee from the Liquor before it ferment, and then away goes the brisk and pleasant Spirits and leave a vapid or sour Drink contracted from the remanent gross Lees; the Cyder made of such Fruit had need be settling twenty four hours in a large Fat or Vessel, that the Fæces may settle before you tun it up, and then draw it off, leaving as much of the thick Lee behind as you can (which yet you may put among your Pressings for a Water Cyder): if you conceive your Cyder still so turbid that it will work much, then draw it into another Vessel by a Tap two or three Inches from the bottom, and so let it settle so long as you think it is near ready to work, for if it work in your Tubs, but little of the gross Lees will you be able to get from it. *Note*, That you must cover it all the time it is in your Tubs, and the finer you put it up in your Vessels the less it will ferment, and the better it will Drink; but in case you chill the Cyder (as it often happens in cold Winter-Weather) so as it doth not work when put into Cask, cast into it a Pint of the Juice of *Alehoof* with half the quantity of *Ising-glass* to refine it, which tho' it do not suddenly, at the Spring it will.

These Directions observed, barrel it up, and when it ceases working, Bung it close and reserve it so till 'tis fit to Bottle, that is, when fine, since till then it will endanger their bursting; and if you would have it very brisk and cutting (which  
most



most affect) put a little lump of Loaf Sugar into every Bottle.

Or you may observe the following Method, which is, That after your Cyder is prest, to strain it, and put it into a Tub or Fat with a Tap to it, which cover close with Sacks or Cloaths, by which means some of the Spirits will have liberty to evaporate; whereas if you put it too soon into a Cask it will reverberate the Spirits too soon into the Liquor, and cause a fermentation before any of the gross Lees are separated from it; for the great thing to be taken care of in making of Cyder, is, only to let so much of the Spirit evaporate as may prevent its fermenting before the gross Lees are separated from it, and yet to keep Spirits enough to cause a Fermentation when you would have it; for if it ferment too much it will lose its Sweetness, and become harsh and small; and if it ferment not at all it will become dead and sower, and therefore let it stand twenty four hours or more in the Fat, according as you find it inclin'd to work, so let it stand longer or a shorter time; and when you draw it off leave as much of the gross Lees as you can behind, for Lees of Cyder are apt to put it into a new ferment upon all changes of Weather. After it hath stood its time in the Fat, put it into the Cask, which fill almost full; but if you find it begin to work much, rack it off again, and take out the gross Lees; and if you find it still upon a fret, repeat the same operation till you can settle it; for it is a very ticklish Liquor and very subject to ferment, especially if the gross Lees are not timely separated from it, and therefore if unsettled or moist Weather happen at the time of its working, it will be so much the more difficult to manage, and will require the more care to be taken of it.

When

When it hath done working, stop it up, only leaving a small vent-hole at your first stopping of it up, at which you may sometimes try if it want vent, lest it break your Cask.

Only I think it necessary to premise, that the suiting of the Fruit to the Soil is a great advantage to the making of Cyder, it being certain, that in many places, even in the same County, there is much better Cyder made in one place than another, tho' both are made the same way and of the same sort of Fruit; and if particular remarks were made of the nature of such Soils and what the natural production of them is, according to the nature of the several Soils already treated of, I believe it would be of advantage to planting and the improvement of Fruit and Cyder.

Mr. Worlidge commends very much brackish Lands near the Sea side as excellent for Fruits, and for Winter lasting Fruit the strong stiff Lands are much the best of any.

But if your Fruit be unripe or your Cyder small, and that you have a mind to strengthen it, especially if you live in the North-country, you may improve it by the following Receipts.

*Raisin Cyder.*

Take *Pippins*, *Pearmains*, &c. and to every Gallon of Juice put two pounds of Raisins, which shred small, cover the Fat, and let them stand two or three days; draw off the Liquor by a Tap, press out the Raisins, and put both Liquors into a Cask that they may ferment, and after a fortnight rack them off. Do not fill the Cask you draw it into, but leave some room for it to ferment in; after which stop it close, only leave a Fisset-hole open or loosely stopp'd; and when it hath done working fill up the Vessel, and when fine, bottle it: Or you may do it another way.

Take your Apples when they relish best, not too green nor too mellow: they who have large  
Planta-

Plantations may shake their Trees a little, and gather those that fall off easily, and press them the same day. Fill not your Cask above three quarters full, and let it stand till it grow clear, which is commonly within eight or ten days, and then draw off only the clear, and fill up a clean Cask almost to the top, giving it vent thrice a day, lest it should burst the Vessel, and so continue to do for a Week.

Then for every ten Gallons of Cyder take one Pound of Raisins of the Sun, and put them into Brandy for a day or two, and then take only the Raisins, and put them into the Cyder, letting it stand three or four days more: lastly, stop the Cask very close, but bottle it not till *March*, except it be of *Codlings*, which will not keep so long.

Another Improvement of Cyder is, what they call *Royal-Cyder*, mentioned by Sir *Jonas Moor*, which is done by adding of the Spirits to it, which corrects the Windiness and Crudities of the Cyder, makes it very agreeable to the Stomach, and gives it the strength of Wine, by adding the goodness of two Hogsheads into one: to do which, put one Hogshead of Cyder into a Still and draw off all the Spirits; after which distil the said Spirits a second time, and put the same into your other Hogshead, and fill it up. Stir it about well and keep it close stopp'd, except one day in ten or twenty let it lie open five or six hours, and within a quarter of a Year, this Cyder will be as strong or stronger, than the best *French-Wine*.

But if you will have it drink like Canary you must add more of the Spirits and as much Sugar or Sweets (the making whereof is hereafter shew'd) as will best please your Palate. And as the proportion of one Pint of good Spirits to a Gallon will make it as strong as *French Wine*, so one Pint and half will make it as strong as *Spanish-Wine*:  
and

and by this means, in the like manner, Perry, the Juice of Cherries, Mulberries, Currants, and Gooseberries, may, by adding thereto their proper Spirits, or any other convenient Spirits, be made as strong as Wine.

I mention other Spirits, because Brandy-Spirits of Wine and of Grain, tho' they will do well, yet they are not so natural and good as what is made of the same sort of Fruit: and the Spirits made of Ale and Beer are the worst of any, unless the Ale or Beer be mixed with Cyder before the Spirits be drawn off; but the Spirits of Beer and Ale will do well to mix with the same kinds, and add very much to their strength, being a mixture much used of late with *Derby* and *Nottingham* Ale, and with strong Beer.

Only note, first, that the stale and sour Cyder which is scarce fit to drink, will make the greatest quantity of Spirits and the best tasted, and that the longer the Spirits are kept the less taste they will have of the Fire; which is the greatest Inconveniency that attends this way of making of Cyder; and therefore I should propose, when you design to be any thing curious, to take only the first running of your Spirits to mix with your Cyder, and to let the small part only be distilled again, to which it will be best to allow as much age as you can to take off the burnt taste: One Gallon of strong Cyder will yield a Pint of Spirits.

As to the time of putting of your Spirits into your Cyder, observe, that the staler your Cyder is before the Spirits are added to it the more time it will take to incorporate, and the sooner they are put in the sooner it will be fit for use, only be sure that your Cyder has done working before you put it in.

The best way to order your Sugar before you put it into your Cyder is, to make it into a kind of  
of



of Syrup or Sweets, by dissolving of it in Water; one hundred weight will make sixteen Gallons, and so proportionably. But before you put your Sugar into the Kettle, take the Whites of thirty or forty Eggs, the more the better, which being well beaten with a thing like a Rod or a Whisk in eight or ten Gallons of Water; put four Gallons of this Egg-Water so prepared into your Kettle, where your Sugar is to be dissolved, then hang it over a gentle Fire, and stir it about till it is dissolved: But be sure when it boils put in more Egg-Water, to keep it from boiling too high, and so continue putting it in, one Quart after another, until all your Egg-Water be spent. But to prepare your Egg-water in parcels, *viz.* a Quart or two at a time, as you use it, is the better way. Now the use of these Eggs is only to raise such a Scum as will carry away not only all the foulness and grossness of the Sugar, but all the Egg also. And when the Scum hath done rising, and is clear taken off, then fill up your Kettle with as much Water as will make up your Quantity, and let it boil to the size of a Syrup, and being cold put it into your Cyder. But if you put in a little Coriander Seed bruised and tied up in a fine Linen Bag whilst it's boiling, it will give it a fine grateful Scent.

Of these Sweets you may put in two or three Gallons, more or less, into an Hogshead as your Palate invites you, or as the Tartness of your Cyder requires. But put them not in till you have racked your Cyder the last time, and that it is past the Fermentation. And before you put your Sweets into the Cask mix your Sweets and the Spirits you intend to put in, together with a like quantity of Cyder, and stir them well together; then put all into your Cask of Cyder, and stir them with all your strength with a strong Staff

Staff in the Bung-hole for one half quarter of an Hour ; after that stop it close, and draw none off till two, three or four Months, by which time it will be answerable to what hath been proposed, only remember, that if you would have it resemble Canary you must add the greater proportion of Spirits and Sweets ; but if *French-Wine*, the less Sweets, or none at all.

As to the sort of Sugar, if the Sweets be made with white, the Cyder will remain pale ; if of brown Sugar, it will raise it to an higher colour : And in my Opinion, the latter is as good as well as the cheapest, since the coursest, by the afore-said Preparation becomes as pure as the finest ; and Sweets being thus made will cost but five Pence *per Quart*.

And thus every Man may merrily make his Varieties of Drink with that which he knows to be good, cheap and wholesome, which is more than he is sure to have at every Tavern, altho he pay three times as much for it : Nor hath he so much reason to suspect these Liquors in those Houses to be so much adulterated as the others, because none of like goodness to the Eye, Scent and Palate can be afforded so cheap to the Pocket.

The husky part of the Apples, after the Cyder, is pressed out, being steeped two or three Days in as much Water as will cover it, and then pressed clean out and kept in a Vessel until it hath well fermented, as also the Lees of all your Cyder will afford Spirit or Brandy, so much, that being added to the Cyder of the same Apples, will make it as strong as *French-Wine*, which is a thing of great advantage.

Spirits being put into Bottles amongst Cyder, or of the afore-said Liquors will not drink well. I was a long time troubled to find how to make this Drink as palatable and pleasing as it was be-

come

come strong and chearing, until I put both Cyder and Spirits into a Wooden Cask. The first I completed was in a Vessel of six Gallons, into which I put two Quarts of the Sweets and three Quarts of the Spirits of Cyder, which after it had lain two or three Months I found to be as strong and pleasing as Canary.

By adding Wormwood to Cyder-Royal as you do to Wine, you may make it as good and grateful to the Stomach, both for procuring Appetite and causing, Digestion, as the best Purl-Royal or Wormwood-Wine. Thus you may have of your own growth Cyder-Royal, Goosberry, Currant, Cherry, &c. from the size of the smallest Wines to the strength and goodness of the best Canary, suitable to all Seasons of the Year, and to the Constitutions of all Persons, and Humours of all Palates, and agreeable to all Ages from Children of twelve Months old, to the height of Old Age.

This Cyder-Royal or New-Wine thus prepared, may be kept in the Cask two or three Years, and be bettered thereby, provided you keep the Cask full; which to do, you must observe, that in two Months time the Liquor will waste a Quart more or less as the Vessel is bigger or lesser, which you ought to fill up again with Liquor of the same strength, or if stronger the better: and by this means it may be kept, and grow better and better some Years without putting into it (as some are said to do into their Liquors) *Stum*, or other unwholsome Ingredients. And,

Suppose by keeping Cyder-Royal too long it should become unpleasant, and as unfit to Bottle as *Old Hockamore*, take but one Hogshead of that, and one of tart new Cyder, and before the latter be quite clear or fine mix them together in two other Hogsheads well perfumed, and add of Spirits and Sweets, a due proportion to the quantity of  
your

your new Cyder: Suppose it be in the Month of *October* or *November*, you may be sure to have it full as good, if not better, than ever it was, and a most excellent Cyder-Royal to drink or to bottle, by or before *Christmas*; and your new Cyder cannot be made half so good by that time of the Year.

As to the Objections made against this sort of Cyder, and the other Particulars relating to it, I shall refer you to a small Treatise of Sir *Jonas Moor's* on this Subject.

Some commend very much the boiling of Cyder, as what gives a mighty strength to it; but it is much better for some sort of Fruits than others. The best sort of Cyder for boiling being what is made of *Pippins*, *Harvey-Apple*, the *Bitter Sweet* (a *Dorsetshire Apple*) whose Juice is much mended by boiling, especially when kept to two Years old: the way of doing which is, to boil it as soon as it is pressed; for if it ferments, the boiling will cause the Spirits to fly away instead of strengthening it; strain the Juice as it comes from the Press, and in boiling of it let it continually be scum'd, and observe the colour of it as it boils; so as not to boil it longer than till it comes to the colour of small-beer: and as soon as it is cold, turn it, leaving only a small Vent in the Cask, the rest being close stopped; and when it begins to bubble out of the Vent, bottle it, only make it not of Fruit that hath been gathered long.

But as Cyder is apt to contract an ill flavour from the Vessel it is boiled in, it is best to boil it in Tin or an Earthen-pot that is wide and open at the top, for the more expeditious wasting of the aqueous and phlegmatick part of the Liquor.

*Of*



*Of Mixtures with Cyder.*

Though Cyder needs not any, it is yet a very proper Vehicle to transfer the vertue of any Aromatick or Medicinal thing, such as Ginger, Juniper, &c. The Berries dried, six or eight put in each Bottle, or proportionably in the Cask, is very good: but this is not so palatable as wholesome.

Ginger renders it brisk, and corrects its Windiness; dried Rosemary, Wormwood, Juice of Corinths, &c. whereof a few drops tinge and add a pleasant quickness, Juice of Mulberries, Blackberries, and (preferable to all) Elder-berries pressed among the Apples, or if to the Juice you add Clove-gilliflowers dried and macerated, both for Tincture and Flavour 'tis an excellent Cordial. Thus may the vertues of any other things be extracted: Some stamp Malaga Raisins, putting Milk to them, and letting them percolate thro' an *Hippocrates's* Sleeve; a small quantity of this with a Spoonful or two of Syrup of Clove-gilliflowers to each Bottle, makes an incomparable Drink.

Honey or Sugar mixed with some Spices, and added to Cyder that is flat, revives it much; let the proportion be more or less according to the quantity of your Cyder.

Mixture of Fruits is of great Advantage to Cyder, the meanest Apples mixed being esteemed to make as good Cyder as the best alone, always observing, that they be of equal Ripeness: but the best mixture, Mr. *Worlidge* says, is Red-streaks and Golden-Rennets together.

If you intend a Mixture of Water in your Cyder, let it be done in the grinding, and it will better incorporate with the Cyder; than if put in afterwards.

Some Cyder will bear a mixture of Water without injury to its Preservation, others will not; therefore be not over-hasty with too much at once, till you understand the Nature of the Fruit.

*How to make Water-Cyder.*

Boiled Water suffered to stand (till cooled) is best for this use, as being more defæcated. This small Beveridge, or Cyderkin and Puree (as it is called) is made for the common drinking of Servants, &c. supplying the place of Small-beer, and to many more agreeable. It is made by putting the Murc into a large Fat, adding what quantity of Water you please, namely, about half the quantity of the press'd Cyder, or more; as you desire it stronger or smaller. Note, that the Water should stand 48 hours on it before you press it; when 'tis pressed tun it up immediately, and it will be fit to drink in a few days, by clarifying of it self. It is fortified by adding to it the Lees or Settling of better Cyder, putting it to the Pulp before Pressure, or by some superfluous Cyder which your Vessels could not contain, or by grinding some fallen and refuse Apples.

Cyderkin will be made to keep long by being boiled after Pressure with such a proportion of Hops as is usually added to Beer; in which case, you need not to boil the Water before.

Some put in Ginger, Jamaica Pepper, and Bay Leaves, instead of Hops; which doth very well.

*Some Observations relating to Cyder.*

'Tis not good to grind or beat Apples in Stone Troughs, because it bruises the Kernel and Stalks, which give an ill favour to the Cyder.

Let

Let not your Apples be ground too small, so as that too much of the Pulp may pass with the Liquor, it being good to strain it from the gross Particles of the Apples before you put it into the Fat.

Upon which account 'tis that the Juice of ripe pulpy Apples, as *Pippins*, *Rennetings*, &c. that are of a syrupy tenacious nature, do detain in them more of the dispersed particles of the Fruit that by the Pressure comes out with the Liquor; which particles or flying Lee being part of the flesh or body of the Apple, is (equally with the Apple it self when bruised) subject to putrefaction, by which means by degrees the Cyder becomes hard or acid; whereas the *Red-streaks*, *Gennet-moyl*, &c. that more easily part from their Liquor without the adhesion of so much of the Pulp, are not so subject to reiterated Fermentation, nor to Acidity, as the other sorts.

For Wine, Ale, Beer, and other Liquors, according as they tend more or less to Acidity, become clearer by the Precipitation of the gross Lees, which being subject (as I said before) to Putrefaction, according as the corrupt Particles are more or less in it, the Liquor becomes so much the sooner or later Vinegar.

As for instance, in Beer, which when 'tis designed for Vinegar is never fermented, nor the Fæces precipitated, as 'tis when preserved for drinking.

And therefore if you intend your Cyder shall retain its full Strength, abstract it from the gross parts, as I said before.

Also Cyder made of green immature Fruit will not fine kindly; and when it doth, it abides not long good; but suddenly becomes eager.

Generally the Cyder that is longest in Fining is the strongest and most lasting, especially if the Fruit hath been kept some time.

But Cyder, or any other Liquor, will be much longer in clearing in mild moist Weather, than cold dry Weather or Frost.

*Isinglass.*

If your Cyder or other Liquor doth not fine, you may take of Water, Glue, or Ising-glass as 'tis commonly called, about the Proportion of three or four ounces to a Hogshead, beat it thin on some Anvil or Iron-wedge, and cut it in small pieces, laying of it in steep in White-wine (which will more easily dissolve it than any other Liquor except Spirits) let it lie therein all night, the next day heat it some time over a gentle Fire till you find it well dissolved, then take a part of your Cyder, as about 1 Gallon to 20 Gallons, in which boil your dissolved Glue, and put it into the whole Mass of your Liquor, stirring of it well, and stopping of it close, so let it stand to ferment eight or ten hours as you please; during which time the Glue being dispersed through the whole Mass of the Liquor, it will precipitate the Lee. When you observe it hath done working, you may draw it out gently at a Tap below the Scum, or you may first gently take off the Scum, as you please: Or you may do it thus, Steep your Isinglass in White-wine, enough to cover it; after 24 hours beat the Ising-glass to pieces, and add more Wine to it, and four times a day squeeze it to a Jelly, and as it thickens add more Wine to it: when 'tis reduced to a perfect Jelly, take about a pint or quart to a Hogshead, and add it to three or four Gallons of the Cyder you intend to fine, and mix well with the Jelly; putting of it into your Vessel of Cyder, stir it well with a Staff. This cold way is much better than the other; for,  
boiling



boiling part of the Cyder makes it apt to decay the sooner.

This Liquor, thus gently purified, you may in a full Vessel preserve a long time, or draw it and bottle it in a few days, there being no more Lee in it than is necessary for its preservation.

A great occasion of spoiling of much Cyder, is the not having of good Cask for it, it being a Liquor very apt to attract any ill flavour from the Vessel; and therefore new Casks very much affect the Cyder with an ill flavour and deep colour: wherefore if you cannot obtain Wine-casks, which are the best, scald your Casks with Water wherein a good quantity of Apple pumice hath been boiled, before you put your Cyder into them. *Cask for Cyder*

Put not Cyder into a Vessel wherein Strong-beer or Ale hath lately been, especially Strong-beer; for it gives a very rank unpleasant Taste to Cyder, so doth a Cyder-Vessel to Beer; therefore a Small-beer Vessel is to be preferred.

If your Vessel be tainted with any ill flavour, boil an ounce of Pepper in Water enough to fill the Vessel; put it in scalding hot, and let it stand therein two or three days.

Or take some quick Lime and put into the Cask, which slack with Water, keeping of it close stop-ped, tumble it up and down till the Commotion cease, and be sure your Cask be dry before you put your Cyder into it. But the most effectual Cure is to take them to pieces, and pare away the Film that is on the inside, and when aired set them together again.

If your Vessel, before the Cyder is tunned up into it, be fumed with Sulphur, it much conduces to the preservation of this or any other sort of Liquor; which may be done by dipping of a Rag in melted Brimstone, and by a Wire letting of it down into the Cask, and fired so as to fill it full *Fuming a Cask*

of Smoak: upon which pour in your Liquor, which will give it no ill Taste, and is an excellent Preserver of Health as well as of the Liquor, and will much help to fine it. Or you may give your Cask a fine scent by taking of *Brimstone* four ounces, of *Burnt Alum* one ounce, of *Aqua Vite* two ounces, melt these together in an Earthen Pan on hot Coals, and dip therein pieces of new Canvas, and instantly sprinkle thereon Powder of Nutmegs, Cloves, Coriander, and Anniseeds: Set this Canvas on fire, and let it burn to fume the Vessel.

But the better way for this Operation is to have a little Earthern-pot to burn the Brimstone in, to the Cover of which have one Pipe to go into the Cask, and another to come into your Mouth, with which you may blow the Fume into the Cask.

After you have closed up your Bung, you ought to leave open a small Vent-hole, or but loosely put in the Peg, lest the Cyder break your Cask: in case the Liquor be unquiet, you may sometimes try the state of your Cyder by often opening of the Vent.

Cyder pressed from pulpy, or thorough-ripe, or mellow Fruit, having lain long in hoard, is not so apt to emit its Spirits as the other, and so is more easily preserved.

The upright Cask is most commended for Cyder, because 'tis apt to contract a Skin or Cream on the top, which helps much to its Preservation, and is in other forms broken by the sinking of the Liquor; but in this 'tis kept whole, which occasions the Briskness of the Drink to the last.

To occasion  
Fermentation.

If Cyder do not work well, put a small quantity of Lime to it, and it will cause it to ferment, not only by reason of its Warmth, but of the quick Salt that is in it: the Powder of calcined Flints, Alabaster, white Marble, Roch-alum, &c. is

is also good; but then the Cyder must be drank or bottled quickly.

The Shavings or Chips of Fir, Oak, or Beech, are great Promoters of Purification or Fermentation; and therefore a new Cask many times occasions Cyder to ferment too much.

Ginger accelerateth the Maturation of Cyder, and gives it more brisk Spirits, helpeth Fermentation, promoteth its Duration, and corrects its Windiness.

If Cyder hath any ill savour or tast from the Vessel, or any other cause, a little Mustard-seed (ground with some of the Cyder and put to it) will help it.

Deadness or Flatness in Cyder, which is often occasioned by the too free admission of Air into the Vessel, for want of right stopping, is Remedied by grinding a small parcel of Apples and putting of them into it, stopping of it up close, only you must sometimes open the Vent that it force not the Vessel; but then you must draw it off in a few days, either into Bottles or another Vessel, lest the Murc corrupt the whole Mass; which may also be prevented in case you press your Apples, and only put in the Juice: the same may be done in Bottles, by adding about a Spoonful or two of new Must to each Bottle of dead Cyder, and stopping of it again. Cyder that is dead or flat will oftentimes revive again of it self, if close stopped, upon the Revolution of the Year and approaching Summer.

*Restoring of  
Cyder.*

But Cyder that hath acquired a Deadness or Flatness by being kept in a Beer or Ale-Vessel, is not to be revived again.

Wheat unground, about a Gallon to a Hoghead, or Leaven or Mustard ground with some part of the Cyder, or rather with Sack, and put into the Cask, is used either to preserve Cyder,



or to recover it when acid : but the best Addition to preserve it, is a Decoction of Raisins of the Sun, or the new Lees of *Spanish* Wine.

Wheat boiled till it begin to break, and when cold put into the Cyder, but not in too great a quantity, and stirred well, will help it much; the like doth Cinamon: the Vessel must be kept close stopp'd.

But there is a difference between sharp or acid Cyder, and a Cyder that is eager or turned: the first hath its Spirits free and volatile, and may easily be retrieved by a small addition of new Spirits, or some edulcorating matter; but the latter hath some of its Spirits wasted and decayed, so that all Additions are but vain Attempts to recover it.

Thick Cyder may, by a second Fermentation, be made good and clear; but acid Cyder is rarely recovered.

Mustard beat with Sack, and put to boil'd Cyder, preserves it, and gives it good Spirits.

Two or three Eggs put into a Hoghead of Cyder that is sharp, sometimes lenifies it; and two or three rotten Apples will sometimes clarify thick Cyder.

Wheaten-bran cast into a Cask after Fermentation thickens the Coat or Cream, and much conduces to its Preservation.

*Bottling of Cy-  
der.*

Bottling of Cyder is the only way to preserve it long, and it may be bottled two or three days after 'tis well settled, and before it hath thoroughly fermented, if it be for present drinking; or you may bottle it in *March* following, which is the best time.

Bottles may be kept all Summer in cold Fountains, provided you pitch the Corks to prevent their rotting; or in Cellars, in Sand, if they are well



well corked: the longer they are kept the better, if the Cyder be good, and have a body.

After Cyder hath been bottled a Week (if 'tis new Cyder, else at the time of bottling) you may put into each Bottle a piece of white Sugar as big as a Nutmeg, this will make it brisk; but if the Cyder be to keep long, it will be apt to make it turn sour.

If your Bottles are in danger of the Frost, cover them with Straw; and about *April* put them into the coldest Repositories.

If your Bottles are musty, boil them in a Vessel of Water, putting of them in whilst the Water is cold to prevent their cracking; and then set them on Straw, and not on a cold floor, when you take them out.

When your Cyder is thus bottled, if it were new at the bottling, and not absolutely fine, it is good to let the Bottles stand a-while before you stop them close, or else open the Corks two or three days after to give the Cyder Air, which will prevent the breaking of the Bottles against the next turning of the Wind into the South.

The meaner Cyder is more apt to break the Bottles than the richer, being of a more eager nature, and the Spirits more apt to fly, having not so solid a body to detain them as the rich Cyders; and observe, that when any of the Bottles break through the Fermentation of the Cyder, to open your Corks, and give them vent, and stop them up again awhile after, lest you lose many for want of this Caution.

Great care is to be had in choosing good Corks, much good Liquor being absolutely spoil'd through the only Defect of the Cork; therefore some much commend Glass-stopples.

If the Corks are steeped in scalding Water a-while before you use them, they will comply better

ter with the Mouth of the Bottle than if forced in dry; also the Moisture of the Cork doth much help it to keep in the Spirits.

Therefore the laying of your Bottles side-ways where your Liquor is very fine, so as that the raising of them may not disturb the Settling, nor the Lee beget any new Fermentation in them, is a great advantage to any Liquor.

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### Chap. VI. *Of Perry.*

**T**HE next Liquor in esteem after Cyder, is *Perry*, the ordering of which being much the same with that of Cyder, I need not say much of it; only you must observe, not to let your Pears be over-ripe before you grind them, because of their Pulpiness, which makes them not easily to part with their Juice: and with some sorts of Pears, the mixing of a few Crabs in the grinding of them, in proportion to the Sweetness of the Pear, is of great advantage to it, making some sorts of *Perry* equal to that of *Red-streak Cyder*.

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### Chap. VII. *Of making other sorts of Wines or drinks of Fruits.*

*Cherry Wine.*

**B**ESIDES Cyder and *Perry*, there are many other Drinks prepared out of our *British* Fruits, as of *Cherries*, &c. which are a Fruit as easily propagated as any, nor is there any Fruit that commonly bears better, nor that yields more Juice; which mixed with the richest *Spanish* Wines makes a very fine Drink, by the addition of some Sugars to it.

Or the Juice it self, pressed out and mixed with a due quantity of Sugar and Water, makes a very rich

rich Wine; that is very comfortable to the Stomach and Nerves.

The *Plumb* is also easily propagated; and no doubt but some of the more juicy sort of them, especially the *Damascen*, would yield an excellent Liquor, but scarcely durable unless boiled with Sugar and well purified, or else the Sugar boiled before-hand in Water, and then added. The Juice of the Plumb being of a thick Substance, will easily bear Dilution: this is easily experimented where Plumbs are in great plenty. *Plum Wine.*

The *Red Dutch Currant*, or *Corinth*, yields a very rich and well-coloured Juice, and a vinous Liquor, which is to be diluted with an equal quantity of Water boiled with refined Sugar, about the proportion of one pound to a Gallon of your Wine (when mix'd with the Water); and after the Water and Sugar so boiled together is cold, then mix it with the Juice of the Currants, and purifie it with Ising-glass dissolved in part of the same Liquor, or in White-wine, as is before directed for the purifying of Cyder, after the rate of an ounce to eight or ten Gallons, but boil it not in a Brass Vessel for the Reasons before mentioned: This will raise a great Scum on it of a great thickness, and leave your Wine indifferent clear, which you may draw out either at a Tap, or by your Siphon into a Barrel, where it will finish its Fermentation, and in three Weeks or a Month become so pure and limpid, that you may bottle it with a piece of Loaf-sugar in each Bottle in bigness according to your Discretion, which will not only abate its quick Acidity that it may as yet retain, but make it brisk and lively.

At the time you bottle it, and for some time after, it will taste a little sweet-sowre, from the Sugar and from the Currant; but after it hath stood in the Bottles six or eight Weeks, it will be  
so

so well united, that it will be a delicate, palatable, rich Wine, transparent as the Ruby, of a full Body, and in a Refrigeratory very durable; and the longer you keep it, the more Vinous will your Liquor be.

Let your Currants hang on the Trees until they are thorough ripe, which is long after they are become red, to digest and mature their Juice, that it need not that large addition of Sugar that otherwise it would do in case the Fruit had been gathered when they first seemed to be ripe, as is vulgarly used, and the common Receipts direct: also it makes the Liquor more Spirituous and Vinous, and more capable of Duration than otherwise it would be if the Fruit had not received so great a share of the Sun.

The *Gooseberry-Tree*, being one of the greatest Fruit-bearing Shrubs, yields a pleasant Fruit; which although somewhat luscious, yet by reason of its gross Lee, whereof it is full, it is apt to become acid, unless a proportion of Water sweetened with Sugar (but not with so much as the other acid Liquors) be added unto it. This Liquor, of any other, will not bear a Decoction, because it will debase its Colour, and make it brown.

There is no Shrub yields a more pleasant Fruit than the *Raspberry-Tree*, which is rather a Weed than a Tree, never living two Years together above ground. Nor is there any Fruit yields a sweeter and more pleasant Juice than this, which being extracted, serves not only to add a Flavour to most other Wines or Liquors, by a small addition of Water and Sugar boiled together, and when cold added to this Juice and purified, makes one of the most pleasant Drinks in the World. The same way *Apricock*, and the Wines of other Fruits may be made,

Having



Having given you a Tast of most Wines made by pressure of the Juices out of the Fruits, you may also divert your self with the Blood of Grapes, or any other of the before-mentioned limpid Liquors tinged with the spirituous Flavour of other Fruits, that cannot so easily and liberally afford you their Juices; as, of the *Apricock*, which steep'd in Wine gives the very Tast of the Fruit; also Clove-gilliflowers, or sweet-scented Flowers do the like. You may also make experiment of some sort of *Peaches*, *Nectarines*, &c. what Effect they will have upon those sorts of Drinks.

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Chap. VIII. *Of the Making of some other Drinks or Wines usually drank in this Island.*

**T**Here are several other Pleasant, wholesome, and necessary Drinks made of Trees, Leaves, Grains, and other things, besides such Drinks or Liquors as are commonly made of the Fruits of Trees or Shrubs.

As *Mead* or *Hydromel*, that is prepared out of *Honey*, being one of the most pleasant and universal Drinks, the Northern part of *Europe* affords; and one of the most antient Drinks of the Northern parts. *Honey* being to be had from the Southerly parts of *Spain* and *Italy*, &c. to the Arctick Circle or Frozen Zone.

Those that lived formerly in the more Southern parts (as *Pliny* reports) made a drink compounded of Honey and tart Wine, which they termed *Melitites*, by the addition of a Gallon of Honey to five Gallons of their Wine: 'tis also an excellent Ingredient mixed with Cyder.

In *Sweedland*, *Muscovia*, and as far as the *Caspian Sea*, they make great account of this Drink; to which Liquor they give a great Advantage by the addition

addition of the Juice of Rasberries, Strawberries, Mulberries, and Cherries.

They also steep Rasberries in *Aqua-vita*, 24 hours, and add it to their *Hydromel*, which is a great amendment of it.

There are very great variety of Receipts for the making of *Metheglin* or *Hydromel*; but the best that I have met with, is to

Take twelve Gallons of Water, and put in the Whites of six Eggs, mix them well with the Water, and twenty pounds of Honey; boil it an hour, and when boiled add Cinamon, Ginger, Mace, Cloves, and a little Rosemary, and when 'tis cold put a spoonful of Yeast to it and tun it up, keeping of it filled up as it works; when it hath done working, stop it up close, and when fine, bottle it.

But the finest *Mead* is that made of what they call *Live-Honey*, which is what naturally runs from the Combs (but that from Swarms of the same Year is the best) and add so much Honey to clear Spring-water, as that when the Honey is dissolved thoroughly, an Egg will not sink to the bottom, but easily swim up and down in it. Boil this Liquor in a Copper-Vessel for about an hour or more, and by that time the Egg will swim above the Liquor about the breadth of a Groat, then let it cool; the next Morning you may barrel it up, adding to the proportion of fifteen Gallons an ounce of Ginger, half an ounce of Cinamon, Cloves and Mace of each an ounce, all grossly beaten, for if you beat them fine they will always float in your *Mead* and make it foul; and if you put them in whilst it is hot, the Spices will lose their Spirits. You may also add a spoonful of Yeast at the Bung-hole to increase its Fermentation; but let it not stand too cold at first, that being a principal Impediment to its Fermentation; as soon as it hath done working, stop it up close, and

and after a Month bottle it; and the longer 'tis kept, the better it will be.

By the floating of the Egg you may judge of its Strength, and you may make it more or less strong as you please, by adding of more Honey or more Water; and by long boiling of it, it is made more pleasant and durable.

The *Sycamore* and *Wallnut-tree* are said to yield an excellent Juice; but that which we have the most experience of, is the *Birch-tree*.

The Juice of which may be extracted in very great quantities: where those Trees are plenty many Gallons in a Day may be gathered from the Boughs of the Tree by cutting them off, leaving their Ends fit to go into the mouths of a Bottle, and so by hanging many Bottles on several Boughs, the Liquor will distill into them very plentifully.

The Season for this Work is from the End of *February* to the End of *March*, whilst the Sap rises, and before the Leaves shoot out from the Tree: for when the Sap is forward, and the Leaves begin to appear, the Juice by a long digestion in the Branch grows thick and coloured, which before was thin and limpid: the Sap also distills not in cold Weather whilst the North and East Winds blow, nor in the Night-time, but very well and freely when the South or West Winds blow, or the Sun shines warm.

That Liquor is best that proceeds from the Branches, having had a longer time in the Tree, and thereby better digested; and acquiring more of its Flavour than if it had been extracted from the Trunk.

Thus many Hogsheads may soon be obtained. Poor People (where Trees are plenty) will draw it for two or three Pence the Gallon: To every Gallon whereof add a pound of refin'd Sugar, and boil it about a quarter or half an hour, then set it

it to cool, and add a very little Yeast to it, and it will ferment, and thereby purge it self from that little Dross that is in the Sugar and Liquor. Put it into a Barrel, and add thereto a small proportion of Cinamon and Mace bruised, about half an ounce of both to ten Gallons, stop it very close, and about a Month after bottle it. Its Spirits are so volatile, that they are apt to break the Bottles unless placed in a cool place, without which Conveniency it will not keep long.

Instead of every pound of Sugar, if you add a quart of Honey, and boil it as before, and adding Spice to it, and fermenting of it as you do *Mead*, it makes an admirable Drink both pleasant and medicinal.

*Ale* also brewed of this Juice or Sap is esteemed very wholesome.

*Mum.*

*Mum* being become a common Drink, and being very wholesome, and what may be made of our own product, I should hope it might be made a home Commodity instead of a foreign: and therefore, for the encouragement of it, I shall give you the Receipt, as recorded in the Town-house in *Brunswick*; which is thus:

Take 63 Gallons of Water that hath been boil'd to the consumption of a third part, brew it according to art with seven bushels of Wheat Malt, one bushel of Oat-Meal, one bushel of ground Beans; and when 'tis tunned, let not the Hogs-head be too full at first; and when it begins to work, put into it, of the inner Rind of Fir three pounds, Tops of Fir and Birch one pound, *Cardus Benedictus* three handfuls, Flowers of *Rosa-solis* a handful or two, Burnet, Betony, Marjoram, Avens, Penny-royal, Wild-thyme, of each a handful and a half, of Elder-flowers two handfuls or more, Seeds of Cardamom bruised three ounces, Barberries bruised one ounce. Put the  
Herbs



Herbs and Seeds into the Vessel when the Liquor hath wrought a while; and after they are added, let the Liquor work over the Vessel as little as may be. Fill it up at last, and when 'tis stopped, put into the Hogshead ten new-laid Eggs, unbroken or crack'd; stop it up close, and drink it at two Years end.

But our *English* Brewers use Cardamom, Ginger, and Sassafras, which serves instead of the inner Rind of Firr, also Walnut-Rinds, Madder, Red Sanders, and Enula Campana; and some make it of Strong-Beer, and Spruce-Beer; and where 'tis designed mostly for its Physical Virtues, some add Water-cresses, Brook-lime, and Wild-parsley, with six handfuls of Horse-radish rasped to every Hogshead, according to what their Inclinations and Fancy most lead them.

Note, That  
 the Rising  
 and Setting  
 of the Sun,  
 and Length  
 of the Days,  
 is computed  
 from the first  
 of every  
 Month, Lond.  
 Lat.

**I**F this Month prove cold, 'tis seasonable to kill the Vermin and Weeds, and to mellow the Ground: and is the chief time to plow up Lays, to fallow the Ground you intend for Pease, to water Meadows and Pastures, to drain arable Grounds where you intend to sow Pease, Beans, Oats, or Barley, to lay Dung on heaps to carry on the Land in Frosty-weather, to make Hedges, Ditches, to cut Ant-hills, and to fill up the Holes in Meadows and Pasture-ground, to gather Stones, &c.

Rear Calves, Pigs, &c. Have especial Care of Ewes and Lambs. House Calves; geld young Cattle soon after they are fallen; feed Doves; repair Dove-coats.

Plant Timber-Trees, Coppice-wood, or Hedge-wood, and also Quicksets; cut Coppices and Hedge-rows; lop and prune greater Trees.

### Work to be done in the Orchard & Kitchen-Garden.

Trees.

Prune Vines and forward Fruit-Trees: if the Weather be open and mild, dig and trench Gardens or other Ground for Pease, Beans, &c. Against the Spring, dig Borders; prepare your Soil or Manure; and suffer no Weeds to grow on them: uncover Roots of Trees where need is, and add such Manure to them as they require, not laying of it too near the Roots: you may also, if the Weather prove mild, set Beans and Pease: as yet Roses may be cut and removed.

Grafts.

Gather Pears, Cherries, and Plum Cions for Grafts about the latter end of this Month, before the Bud sprouts, which stick in the ground for some time, because they will take the better for being kept a small time from the Tree; and graft them the beginning of the next Month. Cleanse Trees of Moss, the Weather being moist.

Make Hot-beds, and sow therein your choice Sallets, as Chervil, Lettice, Radish, &c. Sow early Colliflowers: secure your choice Plants and Flowers from the

Sun { rises 8<sup>h</sup> 0<sup>m</sup> }  $\approx$  { hath days } Long. 8<sup>h</sup> 0<sup>m</sup> 611  
 { sets 4 0 } January { xxxi. }

the injuries of the Weather by Covers, Straw or Dung.  
 Earth up the Roots of such Plants as the Frost hath  
 uncovered.

Set Traps to destroy Vermin where you sow or have  
 such Plants or Seeds as they will injure. Take Fowls;  
 destroy Sparrows in Barns, and near them kill Bull-  
 finches, &c. and in Wet or hard Weather clean, mend,  
 sharpen, and prepare your Garden-tools.

Dig up weedy Hop-gardens.

Turn up your Bee-bives, and sprinkle them with  
 warm and sweet Wort. Also you may remove Bees.

Hops!

Apiary!

Fruits in prime and yet lasting.

Kentish, Russet, Golden, and French Pippins, Apples  
 Kirton Pippins, and Holland Pippins, John Apples,  
 Winter Queenings, Marigold, Harvy-Apple, Pome-  
 water, Golden Doucet, Rennetting, Love's Pear-  
 main, Winter Pearmain, &c.

Winter Musk (*bakes well*,) Winter Norwich Pears  
 (*excellent baked*,) Winter Burgamot, Winter Bon-  
 Chrestien, both Mural; the great Surrein, &c.

**T**his is a principal Seed-Month, for such as they commonly call Lenten Grain, and is usually subject to much Rain or Snow, which is not unseasonable.

Now sow all sorts of Grey-Pease, Fitches, Beans and Black Oats; carry out Dung, and spread it before the Plough, and also on Pasture-Ground; this being the principal Month for that purpose.

This is the best time to plant Trees and Quick, as also to plash it; to set Willows, Plants or Pitchers, and also Poplars, Osiers and other Aquaticks; and to shroud or lop Trees, or cut Coppices.

Sow Mustard-Seed, and Hemp-seed, if the Spring prove mild: feed your Swans, and make their Nests where the Floods cannot reach them.

Soil Meadows that you cannot overflow or water, catch Moles and cut Mole-hills, and take great care of Ewes and Lambs where they are forward.

Work to be done in the Orchard & Kitchen-Garden.

Prune, trim and nail up Fruit-trees, and cleanse them from Moss and Cankers: Now is a good time to graft the more forward sort of Fruit if the Weather be temperate.

Do not prune your tender Wall-fruit till you think the hard Frosts over, tho' it ought to be done before the Buds and Bearers grow turgid, and mind to spread your Wall-trees well at the bottom.

Plant Vines or any sort of Fruit-trees in open Weather; trim up your Pallisado-Hedges and Espaliers; set Kernels, Nuts or Stones of Fruit, and sow other hard Seeds.

Lay Branches to take Root, or place Baskets, &c. of Earth for the Branches to pass through. Graft in the Cleft, and so continue till the latter end of the next Month.

Sow



Sun { rises 7<sup>h</sup> 13<sup>m</sup> } ☒ { hath days } Long. 9<sup>h</sup> 24<sup>m</sup> 613  
 { sets 4 45 } Febr. { xxviii. }

Sow Annise, Beans, Pease, Radish, Parsnips, Carrots, Potatoes, Onions, Parsly, Spinage, Corn-Salletting, and other hardy Herbs or Seeds, and plant Cabbage-plants and Colliflowers in warm places; also Liquorice, and sow Asparagus if the Spring be mild. Now the Bulfinches do the most hurt to Fruit-trees. This is the best time to raise any thing that will grow of Slips.

Make bet Beds for Melons, Cucumbers, &c. continue Vermin-traps, and pick up all the Snails you can find, destroying the Frogs and their Spawn.

This is a good time to sew Fish-ponds, and to take Fish, most Fish being now in Season.

You may, if the Weather prove mild, plant Hops, <sup>Hops.</sup> and dress them that are out of heart. And also dig up your Hop-ground, if 'tis weedy.

Half open the passage for Bees, and now you may remove them, but continue to feed weak Stocks.

### Fruits in prime or yet lasting.

Kentish, Kirton, Russet, Holland Pippins, Deux- <sup>Apples.</sup> ans, Winter Queening, Harvey, sometimes Pome-water, Pome-roy, Golden Doucet, Rennetting, Love's Pearmain, Winter Pearmain, &c.

Bon Chrestien of Winter, Winter Poppering, <sup>Pears.</sup> Little Dagobert.

**I**F this Month prove cold 'tis seasonable to check the pregnant Buds till a more safe Season; and if it prove dry, the Country-man esteems it to presage a happy Corn Year. You may yet prune or plant Trees, tho' 'tis of the latest for all sorts except Winter-Greens.

Let Cattle feed no longer on Meadows that you intend to mow; have a special regard to the Fences both of Meadow, Corn and Woods, and take care of Ewes and Lambs.

About the end of this Month you may begin to sow Barley, earlier in Clay than Sand; you may roll Wheat if the Weather prove dry; make an end of sowing of all sorts of Pulse. You may now shroud or lop old Trees and fell Coppice-wood before the warm part of the Month come in.

This is the only time to raise the best Poultry.

It is now a good time to set Osiers, Willows and other Aquaticks; sow the Rye called March-Rye and Oats, and plant Saffron, Woad, Weld, Madder and Liquorice.

In this Month and the next sow all sorts of French Grasses or new Hays, as Clover, S. Foyn, &c. also now sow Hemp and Flax, if the Weather be temperate.

This is the principal Month in the Year for the destruction of Moles.

Work to be done in the Orchard & Kitchen-Garden.

This is the chief Month for grafting, beginning with Pears and ending with Apples; only if the Spring proves forward, be the earlier. Prune last Year's Grafts, and cut off the Heads of your budded Stocks. Now cover the Roots of all such Trees as you laid bare the preceding Winter, and remove such young Trees as you omitted before, if the Bud is not too forward.

Plant Peaches and Nectarines, but cut not off the Tap-root as you do of other Trees, because it will prejudice them.

Carry Dung into your Orchards, Gardens, &c. turn your Fruit in the Room where it lies, but open not yet your Windows.

Top

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Sun { rises 6<sup>h</sup> 19<sup>m</sup> } ☾ { hath days } Long. 11<sup>h</sup> 22<sup>m</sup> 615  
       { sets 5 41 } March { xxxi. }

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*Top your Rose-trees near a Leaf-bud, and prune off the dead and wither'd Branches, keeping of them to a single Stem. Slip and set Sage, Rosemary, Thyme, Lavender, &c.*

*You may now transplant most sorts of Garden-herbs, Sweet-kerbs, and Summer Flowers. Now is the best time to make Hot-beds for Cucumbers, Melons, &c.*

*Now sow Alifander, Basil, Beets, Borrage, Bugloss, Cabbage, Carrots, Chervil, Cresses, Endive, Fennil, Garlick, Leeks, Lettice, Marigolds, Marjoram, Onions, Orach, Parsnips, Parsley, Pease, Purslain, Radish, Sellery, Smallage, Spinage, Skirrets, Sorrel, Succory, Turneps, Tobacco, &c. and Samphire to replant in May, which will grow well of French Seed.*

*About the middle of this Month dress and string Strawberries, uncover Asparagus Beds, and dig about them. You may also now transplant Asparagus Roots to make new Beds. Slip and plant Artichoaks and Liquorice.*

*Stake and bind up weak Plants against the Wind: Sow Pinks, Carnations, &c. In this Month sow Pine-kernels, and the Seeds of all Winter-greens.*

*Plant all Garden-herbs and Flowers that have fibrous Roots. Sow choice Flowers, that are not natural for our Clime, in hot Beds this Month.*

*You may now plant Hops: this is a very seasonable time to dress them. Now the Bees sit, keep them close Night and Morning: If the Weather prove ill, you may yet remove Bees.*

**Fruits in prime or yet lasting.**

*Golden Ducket (Doucet), Pippins, Rennetings, Love's Pearmain, Winter Pearmain, John Apples, &c.*

*Later bon Chrestien, Double-blossom Pear, &c.*

R r 4

A dry

**A** Dry Season in this Month is best to sow Barley and White Oats in, to prevent Weeds, and likewise to fallow in.

Fell the Timber you intend to bark, if the Spring be forward: cleanse and rid your Coppices, and preserve them from Cattle: keep Geese and Swine out of Commons and Pastures, and water new-planted Trees, if the Weather prove dry.

Pick up Stones in the new-sown Land: sow Hemp and Flax.

Cleanse Ditches, and get in your Manure that lies in Streets or Lanes, or lay it on heaps.

Set Osiers, Willows, and other Aquaticks, before they are too forward.

You may throughout this Month sow Clover-grass, St. Foyn, and all French and other Grasses or Hays; and plant Madder, and be selling of your Winter-fed Cattle.

### Work to be done in the Orchard & Kitchen-Garden.

You may yet graft some sorts of Fruit in the Stock the beginning of this Month.

Now sow all sorts of Garden-seeds in dry Weather, and plant all sorts of Garden-herbs in wet Weather.

Plant Cucumbers, Melons, Artichoaks, and Madder; and sow such tender Seeds as could not abide the harder Frost. Set French-beans, gather up Worms and Snails after Evening-showers, and early in the Morning.

Sow Turneps, to have them early, and your annual Flowers that come of Seeds, that you may have Flowers all the Summer; and transplant such Flowers with fibrous Roots as you left unremoved in March. Sow also the Seeds of Winter-greens.

Now bring forth your tender Plants you preserved in your Conservatory, except the Orange-tree, which may remain till May.

Smoak



SUN { rises 5<sup>h</sup> 18<sup>m</sup> } ☽ { hath days } Long. 13<sup>h</sup> 23<sup>m</sup> 617  
 { sets 6 42 } April { xxx. }

*Smoak your Orchard with Straw towards the Evening.*

*Transplant and remove your tender Shrubs, as Jessamines, Myrtles, Oleanders, &c. Towards the end of this Month, also in mild Weather, clip Phyllyrea and other tonsil Shrubs, and transplant any sort of Winter-greens.*

*Plant Hops, and Pole them the beginning of April, Hop-garden, and bind them to the Poles.*

*Open the Doors of the Bee-hives, for now they hatch, Apiary, that they may reap the benefit of the flowry Spring, and be careful of them.*

*Fruits in prime or yet lasting.*

*Pippins, de uxans, Westberry Apple, Russetting, Apples, Gilliflower, Flat Rennet, &c.*

*Later Bon-chrestien, Oak-Pear, Double-Blof- Pears, som, &c.*

**IF**

**I**F this Month prove dry, it gives great hopes of a full Barn; and if cold, 'tis an Omen of Good for Health. The pleasure of Angling is now in its splendor, especially for the Trout and Salmon.

Now wean those Lambs you intend to have the Milk of their Ewes: forbear cutting or cropping of Trees you intend shall thrive till October: kill Ivy.

If your Barley be too rank, now you may mow it, or feed it with Sheep or Hogs before it be too forward: weed Corn. In some places Barley may be sown in this Month. Begin to fold Sheep, and put your Mares to the Horses.

Now sow Buck-wheat or Brank: sow Latter Pease: also Hemp and Flax may yet be sown: put fattening Cattel and milch Cows into fresh Pasture, and let nothing be wanting in the-Dairy.

Weed Quicksets, drain Fens and wet Grounds, twi-fallow your Land, carry out Soil or Compost, gather Stones from the Fallows, turn out the Calves to grass, over-charge not your Pastures lest the Summer prove dry, get home your Fowl, begin to burn-beat your Land, and stub or root up Goss, Furze, Broom, Bushes, &c. that you intend shall not grow again.

Sell off your Winter-fed Cattel: about the end of this Month mow Clover-grass, St. Foyn, and other French Grasses. Now leave off watering your Meadows, lest you gravel or rot your Grass.

Look well after your Sheep if this Month prove rainy, lest the Rot surprize them.

Work to be done in the Orchard & Kitchen-Garden.

Plant all sorts of Winter-greens, and sow the more tender Seeds, as, Sweet-marjoram, Basil, Thyme, and hot aromattick Herbs and Plants: set Sage and Rosemary.

Smoke

SUN { rises 4<sup>h</sup> 25<sup>m</sup> } II { hath days } Long. 15<sup>h</sup> 9<sup>m</sup> 619  
 { sets 7 35 } May { xxxi. }

*Smoak your Orchard as before, thin your Salletting and other Herbs, that what you leave may thrive the better.*

*Cover no longer your Cucumbers, Melons, &c. excepting with Glasses: sow Purslain, Lettice, &c. and distill Plants for Waters, Spirits, &c.*

*At the end of this Month take up such Tulips as are dried in the Stalk.*

*Bind Hops to their Poles, and make up the Hills after Rain.*

*Now set your Bees at full liberty, and expect a Swarm.*

**Fruits in Prime and yet lasting.**

*Pippins, Deuxans or John Apple, Westberry Apples, Russetting, Gilliflower Apples, the Maligar, &c. Codling.*

*Great Kairville, Winter bon Chrestien, Black Pear of Worcester, Surrein, Double-blossom Pear, &c.*

*The May-cherry, Strawberries, &c.*

*Cherries,  
&c.*

**A** Shower at this time of the Year is welcome, and if the Weather be calm it makes the Farmer smile on his hopeful Crops.

This Month is the prime Season for the Washing and Shearing of Sheep; in forward Meadows mow Grass for Hay.

Cast Mud out of Ditches, Pools, Rivers: This is the best time to raise Swine for Breeders.

Two-fallow your Land in hot dry Weather, it kills the Weeds, and sweetens the Land, one plowing then being worth three or four in rainy Weather.

Carry Marl, Lime and Manure of what kind soever to your Land, bring Home your Coals and other necessary Fuel fetcht far off, before the Teams are busie at Harvest.

You may continue to weed Corn, the beginning of this Month, but not longer; sow Rape and Coal-feed, and also Turnep-feed. Now Mill-dews or Honey-dews begin to fall.

Mind your Sheep, as was advised before in May, and make the first return of fat Cattle.

Work to be done in the Orchard & Kitchen-Garden.

Now begin to inoculate, and beware of cutting of Trees other than the young Shoots of this Year, pluck off Buds where you are not willing they should Branch forth.

Water your latter planted Trees, and lay moist Weeds, &c. at the Roots of them, having first cleared them of Weeds, and a little stirred the Earth, and hoe up all such Weeds as grow in your Nursery.

This is a seasonable time to Distil Aromatick and Medicinal Herbs, Flowers, &c. and to dry them in the shade that you design to keep dry for the Winter, gathering of them in the Full of the Moon, also to make Syrups, &c.

Gather Snails, Worms, &c. and destroy Ants, kill Insects and other Vermin: set Saffron, plant Rosemary



mary and Gilliflowers, sow Lettice, Chervil, Radish and other Sallets for latter Salleting.

Gather Seeds that are ripe, and preserve them cool and dry, water dry Beds, and take up the Bulbous Roots of Tulips, Anemonies, &c.

Inoculate Jessamines, Roses, &c. also transplant any sort of bulbous Roots that keep not well out of the Ground. Now plant Slips of Myrtle, and sow latter Pease.

You may now also (or in May before) cleanse Vines of exuberant Branches and Tendrils, cropping (not cutting) and stopping the second Joint immediately above the Fruit, especially in young Vineyards, when they first begin to bear, and thence forward binding up the rest to Props.

Dig your Ground where you intend a Hop Garden, and bind such Hops to the Poles as the Wind hath shaken off.

Bees now Swarm plentifully, therefore be very vigilant over them, they will requite your care.

### Fruits in prime or yet lasting.

Jennetting (*first ripe*), Pippins, John Apples, Red Apples, billard, Red Fennovil, &c.

The Maudlin (*first ripe*), Madera, Green Royal, Pears, St. Laurence Pear, &c.

Duke, Flanders, Heart Black, Red, White. Cherries

Luke, Ward, Early Flanders, the Common Cherry, Spanish Black, Naples Cherries, &c.

Rasberries, Corinthians, Strawberries, Melons, &c.

**T**HE Earth now would be glad of refreshing showers to moisten the scorched Vegetables. Tempests now much injure the laden Fruit-trees and standing Corn, to the great detriment of the Husbandman.

Now is the universal time for Hay-making: lose not a good opportunity, especially if Fair-weather be scarce.

Mow your Head-lands and try-Fallow where the Land requires it. Gather the Fimble or earliest Hemp and Flax.

At the latter end of this Month Corn-Harvest begins in most places in a forward Year. Still carry forth Marl, Lime, and other Manure: Bring home Timber, Fewel, and other heavy Materials.

Wheat and Hops are now subject to much damage by Mildews.

Sow Turnep-seed in this Month, and sell such Lambs as you have fed for the Butcher.

Work to be done in the Orchard & Kitchen-Garden.

This is the chief time to inoculate choice Fruit, Roses, &c. and for the Summer pruning of Wall-trees for the making of Cherry-wine, Raspberry-wine, &c.

Re-prune Apricocks and Peaches, saving as many of the young likeliest Shoots as are well placed, for the new Bearers commonly perish; the new ones succeeding cut close, and even purging your Wall-fruit of superfluous Leaves, which keep the Fruit from the Sun; but do it discreetly.

Graft by Approach, and inoculate Jessamines, Oranges, &c.

Cut off the Stocks of such Flowers as have done blossoming, and cover their Roots with new fat Earth.

Sow Sallet Herbs for latter Salletting, and also Pease.

Take away Snails from Mural-trees, Slip-stocks, and other lignous Plants and Flowers. Lay Gilliflowers and Carnations for increase, watering of them, and shadowing of them from the fervent heat of the Sun-beams. Lay also Myrtles and other curious Greens. Clip Box and other tansil Plants. Let

Let your Olitory Herbs run to Seeds that you design to save. Transplant or remove Tulips or other bulbous Roots: some may be kept out of the Ground, and others immediately planted.

Towards the latter end of this Month visit your Vines again, &c. and stop the exuberant Shoots at the second Joint above the Fruit (if not done before) but not so as to expose it too much to the Sun without some Umbrage.

Keep down Weeds that they grow not to Seed, and begin your Work of Hoeing so soon as they begin to peep; by this means you will dispatch more in a few hours than afterwards in a whole day, in that the stirring of the Earth will but help the increase of the Seed.

If the Season be dry, the watering of Hops will very much advantage them, and make them the more fruitful; if it prove moist, renew and cover the Hills still with fresh Mold.

Now Bees cast their latter Swarms, which are of little advantage; therefore 'tis best to prevent them: streighten the Entrance of the Hives, kill the Drones, Wasps, Flies, &c.

Fruits in prime or yet lasting.

Deux-ans, Pippins, Winter Russetting, Andrew Apples. Apples, Cinamon-Apples, red and white Jenne-ting, the Margaret Apples, &c.

The primate Russet Pear, Summer Pears, Green Pears. Chissel Pear, Pearl Pear, &c.

Carnation, Morella, Great Bearer, Morocco Cherries: Cherry, the Egriot, Bigarreux, &c.

Nutmeg, Isabella, Persian, Newington, Violet, Peaches: Muscat, Rambouillet.

Primordial, Myrobalan, the red, blue, and am- Plums, &c. ber Violet, Damask, Denny Damask, Pear plum, Violet or Cheson-plum, Apricock-plum, Cinamon-plum, the Kings-plum, Spanish Morocco-plum, Lady Eliz. Plum, Tawny, Damascen, &c.

Rasberries, Goosberries, Corinths, Strawber-ries, Melons, &c. This

**T**His Month returns the Country-man's Expences into his Pocket, and encourages him to another Years Adventure. If it proves dry, warm, and free from high Winds, it saves a great deal of the Husbandman's Expence.

You may yet trifallow, also lay on your Compost or Soil as well on your Barly Land as Wheat Land.

Carry Wood or other Fewel home before Winter.

Provide good Seed, and picked well, against Seed time.

Put your Ewes and Cows you like not to fatting.

This is the principal Month for Harvest for most sorts of Grain, therefore make use of good Weather whilst you have it.

About the end of this Month you may mow your After-grass, and also Clover, St. Foyn, and other French Grass. Geld Lambs, and make the second return of your fat Sheep and Cattel.

Work to be done in the Orchard & Kitchen-Garden.

The former part of this Month is the best time to inoculate. You may now make Cyder of Summer-fruits. Prune away superfluous Branches from your Wall-fruit-Trees; but leave not your Fruit bare, except the Red Nectarine, which is much meliorated by lying open to the Sun, nailing up what you design to spare to cover the Defects of your Walls.

Pull up Suckers from Roots of Trees, unbind the Buds you inoculated a Month before, if taken.

Plant Saffron; set Slips of Gilliflowers; sow Anise. Now is beginning a second Season for the increasing and transplanting of most Flowers, and Garden-Plants and Herbs, Strawberries, &c.

The Seeds of Flowers and Herbs are now to be gathered: also gather Onions, Garlick, &c.

Sow Cabbage, Colliflowers, Turneps, and other Plants, Roots and Herbs, for the Winter, and against Spring; and also Endive, Angelica, Scurvy-grass, &c.

Now



SUN { rises 4<sup>h</sup> 43<sup>m</sup> } 17<sup>th</sup> { hath days } Long. 14<sup>h</sup> 33<sup>m</sup> 625  
 { sets 7 17 } August { xxxi. }

Now sow Larks-heels, Candy-tufts, Columbines, &c. and such Plants as will endure the Winter.

You may yet slip Gilliflowers, and transplant bulbous Roots. About Bartholomew-tide, some esteem the only secure season for removing of Perennial or Winter-green, as Phyllyrea's, Myrtles, &c. It is also the best time to plant Strawberries: and 'tis not amiss to dress Roses that have done bearing, and plant them about this time.

Prop up those Poles the Wind blows down: also near the end of the Month gather Hops.

Towards the end of the Month take Bees, unless the goodness of the Weather provoke you to stay till the middle of the next Month. Destroy Wasps and other Insects; and straiten the Passages to secure them from Robbers.

### Fruits in Prime and yet lasting.

The Ladies-longing, Kirkham Apple, John Apple, Seaming Apple, Cushion Apple, Spicing Mayflower, Sheeps-snout.

Windsor, Sovereign, Orange, Bergamot, Slipper Pear, Red Catharine, Ring Catharine, Penny Pear, Prussia Pear, Summer Poppering, Sugar Pear, Lording Pear, &c.

Roman Peach, Man Peach, Quince Peach, Ram-bouillet, Musk Peach, Grand Carnation, Portugal Peach, Crown Peach, Bourdeaux Peach, Lavar Peach, Peach Despot Savoy, Malacota.

The Muroy Nectarine, Tawny, Red Roman, Little green Nectarine, Cluster Nectarine, Yellow Nectarine.

Imperial Blue, White Dates, Yellow Pear-Plum, Black Pear-plum, White Nutmeg, Late Pear-plum, Great Anthony, Turkey-plum, the Jane-plum.

Cluster Grape, Muscadine, Corinthians, Corneli-ans, Mulberries, Figs, Filberts, Melons, &c.

**G**entle Showers now do well, and make the Earth mellow, preparing of it for Wheat, which delights in a moist Receptacle; but still Weather and dry is most seasonable for the Fruits yet on the Trees. The Salmon and Trout in moist Rivers go now out of season till Christmas.

This Month is the most universal time for the Farmer to take Possession of his new Farm. Get good Seed, and sow Wheat in the Dirt, and Rye in the Dust.

Mend the Fences about the new-sown Corn; scare away Crows, Pigeons, &c.

Geld Rams, Bulls, &c. Sew Ponds: Put Boars up in the Sty.

Beat out Hempseed, and water Hemp; gather Mast, and put Swine into the Woods.

Carry home Brakes, saw Timber and Boards, and manure your Wheat Lands before the Plough. Thatch your Stacks and Ricks, and make an end of Carting.

### Work to be done in the Orchard & Kitchen-Garden.

You may now make Cyder and Perry of such Fruits as are not lasting, and gather your forwardest Fruit, but not your lasting Winter-fruit till after Michaelmas. Also gather your Windfalls every day that is dry.

Release inoculated Buds if not done before, especially if they pinch.

Sow Cabbages, Colliflowers, Turneps, Onions, &c. Transplant Artichoaks and Asparagus Roots, and Strawberries out of the Woods. Plant forth your Cabbages, and Colliflowers that were sown in August, and make thin the Turneps where they grow too thick.

Now plant your Tulips, and other bulbous Roots you formerly took up; or you may now remove them: You may also transplant all fibrous Roots.

Now withdraw your choice Plants into the Conservatory, and shelter such Plants as are tender and stand abroad.

Towards

Sun { rises 5<sup>h</sup> 41<sup>m</sup> }  $\approx$  { hath days } Long. 12<sup>h</sup> 37<sup>m</sup> 627  
 { sets 6 19 } Sep. { xxx. }

*Towards the end of this Month you may gather Saffron, and earth up your Winter-Plants and Sallet Herbs; and prepare Compost to trench your Earth and Borders with.*

*Now finish the gathering and drying of your Hops, cleanse the Poles of the Hawm, and lay up the Poles for next Spring.*

*Take your Bees in time; straiten the Entrance into the Hives, and destroy Wasps, &c. Also you may now remove Bees.*

### Fruits in prime and yet lasting.

*The Belle-boone, the William Pearmain, Lord-  
 ing-Apple, Pear-Apple, Quince-Apple, Red-green-  
 ing, Ribbed bloody Pippin, Harvy Violet Ap-  
 ple, &c.*

*Hamden's Bergamot (first ripe,) Summer Bon  
 Chrestien, Norwich, Black Worcester (baking,)  
 Green-field, Orange Bergamot, the Queen-hedge  
 Pear, Lewis Pear (excellent to dry,) Frith Pear,  
 Arundel Pear (also to bake,) Brunswick Pear, Win-  
 ter Poppering, Bings Pear (baking,) Diego, Em-  
 perours Pear, Bluster Pear, Messire Jean, Rowling  
 Pear, Balsam Pear, Bezy D' Hery, &c.*

*Malacoton, and some others, if the Year prove back-  
 ward, Almonds, Quinces, &c.*

*Little blue Grape, Muscadine Grape, Frontiniac,  
 Parsly, Great blue Grape, the Verjuice Grape (ex-  
 cellent for Sauce, &c.) Barberries, &c.*

**O**CTOBER often gives an earnest of what we are to expect from the succeeding Winter.

If it prove Windy, as it usually doth, it finishes the fall of the Leaf, and also shakes down the Mast and other Fruits, leaving neither Leaf nor Fruit.

Lay or Plow up your Barley Land as dry as you can. Seed time yet continues, especially for Wheat.

Well Water-furrow, and Drain new sown Corn Land. Now it is a good time to sow Acorns, Nuts, or other sorts of Mast or Berries for Timber, Coppice-wood or Hedges. You may still gather Saffron.

Sow Pease in a warm fat Land, you may plant Quick-sets, and all sorts of Trees for Ornament or for Use, and also plash quick Hedges.

Wean the Foals that were foaled of your Draught Mares; at Spring put off such Sheep as you have not Wintering for.

Follow Malting, this being a good time for that Work.

Spare your private Pastures, and eat up your Corn Fields and Commons, give over folding of Sheep, and separate the Lambs from the Ewes that you design to keep for your own use.

Work to be done in the Orchard & Kitchen-Garden.

Make Cyder and Perry of Winter Fruit throughout this Month; now is a very good time to plant all sorts of Fruit-trees, or any other Trees that shed their Leaf.

Trench stiff Grounds for Orcharding and Gardening to lie for a Winter fallowing. Now is the time for Abliqueation or laying open of the Roots of old or unthriving Trees, or such as spend themselves too much or too soon in Blossom.

Gather the residue of your Winter-Fruit, also gather Saffron.

Sow all sorts of Fruit-Stones, Nuts, Kernels and Seeds, either for Trees or Stocks; some also sow Pease  
in



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Sun { rises 6<sup>h</sup> 36<sup>m</sup> } m { hath days } Long. 10<sup>h</sup> 47<sup>m</sup> 619  
 { sets 5 24 } Oct. { xxxi. }

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*in a rich warm Soil to be early in the Spring; and you may yet sow Genoa Lettice, which will last all the Winter, and Parsnips. Choose no Trees for a Wall that are not above two Years grafting.*

*Many of the September Works may be yet done, if the Winter be not too forward.*

*Now plant your bulbous Roots of all sorts, and continue planting and removing several Herbs and Flowers, with fibrous Roots, if a former and better season be omitted.*

*This Month is the best time to plant Hops, and you may bag or pack those you dried the last Month.*

*Now you may safely remove Bees.*

Bees.

Fruits in prime or yet lasting.

Belle and Bonne William, Costard, Lording, Parsley Apples, Pearmain, Pear-apple, Honey-meal, &c.

The Law-pear (*baking*), Green Butter-pear, Thorn-pear, Clove-pear, Rouset-pear, Lombert-pear, Russet-pear, Saffron-pear, Violet-pear, Petworth-pear or Winter-Windsor.

Bullace, and divers of the September Plumbs and Grapes, Pines, Arbutus, &c.

**T**HIS Month generally proves dry, and the Earth and Trees are wholly unclothed. Sowing of Wheat on a conclusion is yet allowable on very warm rich Land, especially such as are Burn-baited.

The Country-man now generally forsakes the Fields, and spends his time in the Barn and Market.

Fat Swine are now fit for slaughter, lessen your stocks of Swine and Poultry.

Thrash not Wheat to keep till March, lest it prove foisty.

Lay Straw or other wast stuff in moist places to rot for Dung; also lay Dung on heaps.

Fell Coppices, Wood and Trees for Mechanick Uses, as Plough boot, Cart-boot, &c. and plant all sorts of Timber or other Trees: break Hemp and Flax.

Now you may begin to overflow your Meadows that are fed low, and to destroy Ant-Hills.

Work to be done in the Orchard & Kitchen-Garden.

Pease and Beans may now be set to be early in the Spring, Trench or Dig Garden Ground.

Remove and plant Fruit-trees, and furnish your Nurseries against Spring.

Lay up Carrots, Parsneps, Cabbages, Colliflowers, &c. either for your Use, or to transplant for Seed at Spring; cover Asparagus-Beds, Artichoaks, Strawberries, and other tender Plants with long Dung, Horse-litter, Straw or such like, to preserve them from Frost. Dig up Liquorish.

Now is the best Season to plant the fairest Tulips, if the Weather prove not very bad.

Cover with Mattresses, Boxes, Straw, &c. your tender Seedlings. Plant Roses, Lilac, and several other Plants and Flowers, the Weather being open.

Take up your Potatoes for Winter spending, trench and fit your Ground for Artichoaks, &c. as yet you may sow Nuts, Stones, &c.

Now

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SUN { rises 7<sup>h</sup> 34<sup>m</sup> } ☿ { hath days } Long. 8<sup>h</sup> 52<sup>m</sup> 611  
 { sets 4 26 } Nov. { xxx. }

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Now carry Dung into the Hop Garden, and mix Hops. it with Earth that it may rot against Spring.

You may this Month close stop up your Bees, <sup>so Apiary.</sup> that you leave breathing Vents, or you may House them till warm Weather.

Fruits in prime or yet lasting.

The Belle Bonne, the William, Summer Pear- <sup>Apples.</sup> main, Lording Apple, Pear Apple, Cardinal, Winter Chesnut, Short Start, &c. and some of the former Months.

Messire Jean, Lord Pear, Long Bergamot, <sup>Pears.</sup> Warden (to Bake,) Burnt Cat, Sugar Pear, Lady Pear, Ice Pear, Done Pear, Deadmans Pear, Winter Bergamot, Bell Pear, &c.

Arbutus, Bullaces, Medlars, Servises.

**T**HE Earth is now commonly locked up under its frozen Coat, that the Husbandman hath leisure to sit and spend what Store he hath before-hand provided.

Now is the time to house old Cattle, and cut to all sorts of Timber and other Trees for Building or other Utensils; to fell Coppices, &c.

Let Horses blood, fatten Swine and kill them. Destroy Ant-hills.

Plow up your Land that you design for Beans; drain Corn fields where Water offends, and water or overflow Meadows.

Put your Sheep and Swine to the Pease-rick, and fat them for a Market. Cut Hedges and Trees.

Work to be done in the Orchard and Kitchen-Garden.

You may now set or transplant such Fruit or other Trees as are not very tender, not subject to the Injuries of Frost, in open Weather.

Also you may plant Vines, or other Slips or Cions, and Stocks for Grafting; and also prune Vines if the Weather be open.

Cover the Beds of Asparagus, Artichokes, and Strawberries with Horse-litter, &c. if not covered before.

Sow Beans and Pease, if the Weather be moderate. Trench your Ground, and dress it against Spring.

Set Traps for Vermin, and pick up Snails out of the holes of Walls, &c.

Sow or set Bay-berries, Laurel-berries, &c. dropping ripe. This Month you may dig up Liquorice.

Hop-garden.

Dig a weedy Hop-garden, and carry Dung into it, which mix with Earth.

Apiary.

Feed weak Stocks.

Fruits in prime or yet lasting.

Apples.

Russetting Pippin, Leather-coat, Winter-red Chestnut Apple, Great-belly, the Go-no-farther or Cats-head, with some of the precedent Month.

Pears.

The Squib-pear, Spindle-pear, Doyoniere, Virgin, Gascoigne-bergamot, Scarlet-pear, Stopple-pear, White, Red, and French Wardens (to bake or roast) &c, Dead-man Pear, excellent, &c.

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Twitch	



# TABLE.

<i>Twitch or Quitch Grass</i>	241	<i>Weeding of Corn</i>	101	
<i>Tyling</i>	303	<i>Weld</i>	128	
V.		<i>Wheat Barly</i>	102	
V	<i>Etches</i>	108	<i>Wheat</i>	99
	<i>Vine</i>	555	<i>Wheat to keep</i>	115
	<i>Vineyards</i>	556	<i>Wheat its use</i>	258
	<i>Virginia Climber</i>	498	<i>White Oats</i>	105
	<i>Unfruitfulness of Trees</i>	527	<i>White Thorn</i>	4
	<i>Up-lands</i>	12	<i>Wines to order</i>	561
	<i>Urin good for Land</i>	91	<i>Withy and Willow</i>	363
<i>Urry</i>	96	<i>Woad</i>	127	
W.		<i>Wood and Trees to stub</i>	416	
W	<i>Allnut Tree</i>	342	<i>Woodbine</i>	499
	<i>Walks and Ave-</i>		<i>Worms to kill</i>	177
	<i>nues</i>	388	<i>Worm in the Tail</i>	176
	<i>Wall-Trees and Walls</i>	527	<i>Computation of the Hus-</i>	
<i>Water Trefoil</i>	145	<i>bandman's Works</i>	307	
<i>Water Cyder</i>	594	Y.		
<i>Weasels</i>	244	Y	<i>EW Tree</i>	373
			<i>Yucca</i>	499

F I N I S.

## ERRATA.

**T**HE Trough at the bottom of Page 22. is turn'd wrong side up. p. 59. Line 30. For *Hersfordshire* read *Herefordshire*. p. 101. l. 11. for *Gravel* r. *Gavel*. p. 165. l. 27. for *Stone-horses* r. *flout horses*. p. 194. l. 31. r. in *Gardens*. p. 224. l. 26. for *above* r. *about*. p. 305. l. 13. for *once* r. *one*. p. 426. l. 7. for *cutting* r. *counting*. p. 428. l. 25. after *Ground* add a *Comma*. p. 545. l. 4. dele *small*. p. 566 l. 20. for *that* r. *the* p. 571. l. 26. r. *vent-hole*. p. 583. l. 25. for *under it* r. *under them*. p. 588. l. 6. r. *Brandy*.





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